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H. B. McMEAL, PRESIDENT AND EDITOR — F. S. KENFIELD, VICE-PRESIDENT — H. D. FARGO, SECRETARY AND TREASURER
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A Law Against Unfair Competition.

Not long ago TELEPHONY called attention editorially to a flagrant instance of unfair telephone competition in Michigan. Railroad Commissioner Hemans, in makiing an investigation of the situation in that state, discovered that the Bell was charging a $24 rate in Kalamazoo for a service presumably less valuable than the service in Grand Rapids for which only $18 was charged.

The fact that Grand Rapids has nearly three times the population of Kalamazoo made the condition look very puzzling to the commissioner who knew that the larger city, with its greater number of telephone subscribers, should have paid more, not less, than the smaller community. Then he looked into the competitive conditions existing and the mystery was solved. In Grand Rapids there is a strong Independent telephone company—the Citizens—which far outnumbers the Bell in point of subscribers. Therefore the Bell made a low rate in that city in its effort to harass and undersell its successful competitor. In Kalamazoo, however, the competition was not so keen and the rate was higher.

A new law has just gone into effect in California to prohibit such cut-throat tactics among public utilities. It became operative August 10, and is described as a statute which makes it unlawful for "any person or corporation engaged in the distribution or sale of the product or service of any public utility, to discriminate between different sections, communities or cities or portions thereof, by furnishing such service at a lower rate in one section, community or city or any portion thereof, than in another, after making allowance for difference, if any, in the grade, quality, or quantity, and for cost differences between such places due to distance from the point of production, manufacture or distribution, and expense of distribution and operation, *where such discrimination is made with the intent to destroy the competition of any regularly established dealer in such commodity, product or service, or to prevent the competition of any person, firm, private corporation or municipal or public corporation who or which in good faith intends and attempts to become such dealer.*"

This law should prevent unfair competition such as noted in Michigan. Doubtless its framers had in mind the fact that, where such cut-throat competition drives one company from the field, the company remaining usually boosts rates so as to make up the loss sustained in forcing the other to withdraw. Similar actions on the part of the big trusts have done much to bring about government prosecutions of such combines.

The California law does not contemplate prohibiting this meeting in good faith of a competitive rate, or preventing a reasonable classification of service by public utility companies for the purpose of establishing rates. Its avowed aim is to prevent unfair competition, which is the usual forerunner of an oppressive monopoly. Such a law should be national in scope, so that if individual states cannot successfully enforce it the federal authorities can be called upon to act.

A Preventative of "Telephone Borrowing."

The problem of telephone borrowing by non-subscribers of an exchange is one which telephone managers have combated for many years. Many plans have been tried in efforts to abate this nuisance, thereby to increase the efficiency and also the revenue of the company.

The latest method is told in a news dispatch from Independence, Kans., which reveals a unique plan for the elimination of the habit. Incorporated in a new rate agreement made by the two telephone companies with the city is a condition which prohibits telephone borrowing. The use of telephones by non-subscribers in Independence had become so general that the two local telephone companies stated that they could no longer afford to let it continue and the insertion of a clause prohibiting borrowing was the one condition upon which the new rate agreement was made. The question which the companies will now face is: "How will this provision be enforced."

Rich Man! Give Your Son a Chance

By HERBERT KAUFMAN

You're a high jumper! Behind you lies a long road of barriers. You didn't clear them easily. One after another they challenged your courage and your staying power, tested your strength, and forced you by sheer tenacity and doggedness to clear the mark. Necessity urged you to your utmost. Ambition plied the whip and perhaps hunger dug the spurs for many a weary day and night.

Yours was a hard school, but the best. It taught you common sense and caution, and daring and readiness. You had nothing to fall back on, so you had to go on.

Every day demanded its toll of effort and shrewdness. You couldn't shirk. You couldn't postpone. You couldn't hesitate. You were dependent upon your own will and skill for the roof over your head, the clothes on your back, and the food on your plate.

Hold on there! Don't begin to pin medals on your proud and swelling chest. It was not through choice alone, that you became a reliable, conservative, respectable citizen. You possessed no alternative!

Had you been given the chance to fritter your energy in dissipation; had you the means or the opportunity to waste your inheritance of brains and vitality among the lotus blossoms, it's an even break that you would have taken advantage of the situation just as readily as your own son is now squandering his and your assets. He isn't necessarily an inferior boy because he hasn't yet demonstrated the desire or aptitude to assume duties and responsibilities. So don't criticize him until you make sure where the responsibility actually rests.

The very fact that you are a self-made man renders you doubly culpable. You've been over the route and aware of all the handicaps that face a youngster in the big life fight.

Why don't you give the boy the benefit of your knowledge? Even the bluest blooded thoroughbred can do no more than endow his colt with a heritage of wind and spirit and mettle. After that, it's up to the trainer. He can't strike a winning stride until it has been drilled into him as cruelly and as persistently as it was taught his sire.

You overestimate the potency of mere wealth. It won't stick to unskilled fingers.

It doesn't take long to turn a spendthrift into a pauper. And the man who has no knowledge of the processes by which fortunes are created, can't defend his assets from the eager horde of hard pressed poor men's sons, educated by stress and need to battle for their futures.

You've misplaced many a coddled, pampered, cocksure rival, and the very methods that made you great will be adopted by an immigrant or a farm boy, whose father didn't give him the right to choose between leisure and labor.

By seeking to eliminate hardships from the path of your children, you are removing the very incentives that teach force and character and self-defense.

Until a man is competent to stand alone, he doesn't stand a show!

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Telephone Construction and Operation in Northern Spain

Progress Being Made Toward Modern Installations in Northern Districts—Description of Old Plant and Some Odd Constructions — Types of Switchboards in Use and How They Were Operated — Reproduced Through Courtesy of The Telephone Review

By K. Bretscher

Going to Spain and expecting to find well-developed telephone systems there is about the same thing as going to the United States to look for messengers riding on a mule from the farm to the town with the most urgent news. Spain with about 22,000,000 inhabitants has now about 22,000 telephone subscribers, thus leaving ample space for new ones.

However, a slight progress can be noted, especially in the northern part of the country, where the mountains diminish the effects of the heat and make the inhabitants more enterprising. Furthermore, this part of the country, near the Gulf of Vizcaya, is occupied by the remnants of a race entirely different from the real Spaniards. These are the Basks, descendants of the Celts, who resisted in a few parts of Europe both the assaults of the Romans and later on, the invasions by the Teutonic race. A very strong spirit for national liberty prevails in these Bask provinces, which extend between the Gulf of Vizcaya and the picturesque range of the Pyrenees and over the crest of the latter nearly down to the valley of the Ebro. The Basks are a very sympathetic race of people regarding personal character and honesty, as are all Spaniards in those respects.

In the largest city of this district in Spain, which is the foremost as far as agricultural and industrial development are concerned, the Bell Telephone Mfg. Co. installed its first common battery plant—that is to say, in the fashionable bathing place of San Sebastina.

The writer happened to be in charge of the construction of the second common battery plant in Spain, which was ordered by the municipality of Pamplona, the capital of the province of Navarra.

As the description of an ordinary plant with only 300 lines would be of no interest to the readers, this article is confined to the description of their old fashioned system. However, the writer first wishes to add some remarks regarding the town of Pamplona itself, which has 30,000 inhabitants, and the life in it.

As it is only 50 km. distant from the French border, it has always been considered as a strong military point. Its most important protection consists of a modern fortification on the top of the Mont San Cristobal overlooking the valley and the town with the northern entrances to

The Old 100-Line Switchboard in Central Office at Pamplona.

that valley. But still, the old walls and trenches around the very favorably situated place are kept in good condition. The town lies on the edge of a wide plateau, falling steeply down to the river Arga which surrounds Pamplona on three sides and for this reason only one side had to be fortified. Three old gates with draw bridges, which ten years ago had still to be closed by order of the military department in Madrid, give the city a very romantic as-

The River Arga Surrounds Pamplona on Three Sides.

Pamplona, Spain. Mont San Cristobal in the Distance.

spect. Curiously enough, this strong place is partly an agricultural and cattle raising town, a herd of cattle being driven out of town every morning, and return every night.

This town had an old telephone plant with some 170 subscribers. It cannot be considered as a good certificate for the quality of the system and the service, that this number dropped down to 136. Under these circumstances, it was very hard for the salesman to convince the city authorities that they wanted a common battery switchboard and 300 subscriber lines. Most of the subscribers had to content themselves with an old Ader transmitter, combined with an induction coil and battery bell. Only a few subscribers had the chance to possess a magneto set and to talk into a regular transmitter instead of against a board.

Ader Transmitter with Induction Coil and Battery Bell.

The line plant was worth seeing. For instance, I once observed a pair of bare wires lying on a roof; one of them was covered by a half-cylinder tile in order to prevent it from touching its mate. A part of the open wire lines is seen in the illustration showing the old gate. For crossing streets, two or three cables with 10 or 15 rubber covered pairs were hung up in the air. A very interesting distribution device replaces the cable terminal box. A small wooden board is fastened in a dark archway, in the open air and visible to the public. Two rows of nails in this board represent the distributing frame and around these nails, are slung all the terminating cable wires, nicely twisted together. Also the central office was not very modern.

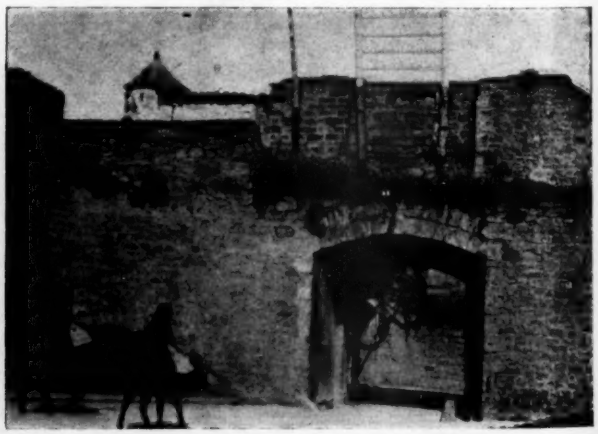
There were two types of switchboards in the same room, a very old one for 100 lines, similar to a telegraph plug switch, but too small now and out of commission. The second, which we might call the newer one, because its age did not reach 20 years is shown in one of the illustrations. It took about a minute to establish one connection with it.

Seeing a drop fall, the operator first took one of the double plug ended, two-conductor cords to connect one of the two jacks of the calling subscriber to the jack of the operator's set—a hand telephone set! She did not wait a long while to take the latter in her hand, to press down the battery switch on it and to ask the waiting subscriber what he wanted, releasing every time the battery contact for listening, and therefore producing funny clicks in the subscriber's ear. Then she took a second cord similar to the first mentioned, put one plug of it in the second jack of the calling subscriber, adjacent to the first, and the second plug in the jack of the wanted party, if she found his name on one of the name plates of the same position. If not, she started to put up a trunk connection by putting the second plug of the connecting cord in a trunk jack, multipled on the second and third position. Then she walked down to that position, took a third cord and established the connection, walked back to the first position and rang over the cord connecting the operator's set to the first jack of the calling subscriber.

To call a subscriber with a battery bell, she pressed down a heavy Morse key; to ring a magneto apparatus, she turned a generator. Of course, she was ringing both the calling and the called-for party, but it did not matter, as the former generally did not wait with receiver at the ear.

When instructing the operators with the new system, the writer had a hard fight against the old operators' habits. They would not admit that it was easier to work with a modern common battery switchboard than with their old jack box, until about two weeks after the cut-over. How the public appreciated the new system can be seen from the fact that three weeks after the cut-over, the number of subscribers reached 350 and that four weeks later the toll business of that town (private concern) doubled.

Herd of Cattle Driven Through Gates on Way to Pasture.



One of the Three Old Gates with Drawbridges.

Some September Signs

A Big Bluff – Hard Sledding for Monoply, Etc.

By J. C. Kelsey

The Currency Bill has passed the House. Will the bankers make good their bluff? That is the question.

I will wager you that these fire-eating and rotund gentlemen will come into the federal bank system just as sweetly as you please. It is a serious matter to refuse to have anything to do with the government.

After all, the government is the public, and the bankers are just sulking and telling the public they won't play. Sounds just like ten-year-old kids!

The new banking act does not concern the banks any more than you and me. You and I, as a part of a long-suffering public, have a right to know how we are being exploited. And we know now how it has been done.

Will the national banks give up their charters within the year? And take out state charters?

No bank has to come in. It can stay out all day and play to its heart's content.

No angry government parent will be waiting to punish the erring child.

Today there are 7,500 national banks, and 18,000 state banks.

The state banks have just as big an opportunity to grow large, and have done so; so let the great national bankers become great state bankers.

The planet will not feel the least jar.

Naturally, the bankers object to control.

You remember how the railroads moaned when the question of commerce control came up, and you have seen no wicked results either.

As prophets, the beneficiaries of privilege are not rated very high. No prediction made by these mournful gentlemen has ever come true.

One of the hateful details of the currency bill will make you *angry*, I am sure—and it will make Chicago mnaufacturers and dealers particularly mad. It does away with the charges for collection on checks. This will be done by the federal reserve banks free of charge.

This will be quite hard on the banking fraternity and cause them much heartache.

But it is not the details which hurt. No big bank wants legislation which will disturb its very pleasant relation with Wall Street gambling.

That is the very purpose of the bill. It discourages stock gambling, with its demoralizing influences, and substitutes in its place an encouragement of industry and commerce, with its thrift and consequent happiness.

The banking system today encourages and promotes stock gambling. It is not denied. It could not live as a legitimate industry, because its devotees do not believe in legitimate industry.

Here is the way it works: A small bank in need of currency, applies to a neighboring city big bank.

In return, the small bank keeps a part of its reserves in the big bank. So far, so good.

There are practically 50 reserve cities, grouped around New York, Chicago and St. Louis as reserve centers.

The 47 reserve city banks are allowed by law to deposit half of their reserves in the banks of the reserve centers.

They have their cake and eat it, too, because this reserve money sent to New York, Chicago or St. Louis, still counts to their credit, the same as cash in their vaults.

The three central reserve cities have to hustle to make money on these reserves and yet be able to send the money back if the local reserve banks need it.

So they loan it where it can be called. And the place where money can be loaned on call is Wall Street.

It is this reserve fund, collected from 47 important centers, which gives all the activity to the stock exchanges.

Three-fourths of these funds are used in stock gambling, while industry and commerce divides up the remaining fourth.

It is this enormous fund, collected from 47 important cities, and 4,700 lesser important cities, that makes big loans to "Big Business."

"Big Business" is a term synonymous to monopoly—and that is why monopoly makes such headway. Its promoters, with your money, cut off every line of credit from successful competitors.

Just to show how strong this reserve business is: On one day, $240,000,000, belonging to 7,500 national banks in "our land of the free and home of the brave," were in the custody of bankers who live by Wall Street prostitution.

All opposition to the Currency Bill comes from the beneficiaries and privileges of monopoly.

It will be futile—just as foolish as opposition has been to moral and economic reforms of past history.

No banker wants to see the government as a competitor. Yet that is exactly what he is trying to do when he opposes the bill. If he wants the government, or the public, to keep out of the banking business, let him get busy and co-operate.

It is a curious phase of our existence that we always oppose things which will eventually do us the most good.

Any institution which encourages stock gambling, which after all, is the heart of big business and monopoly, is doing the wrong thing. Monopoly defeats itself.

We saw the New Haven Railway absorb all the competing railways from England; and we saw it bargain with the Grand Trunk System of Canada to keep away from Boston; and we saw it buy steamship lines, and trolley lines by the dozen.

What have we today? Not the proudest American corporation, but a weak, crumbling, whining creature, almost ready for the receiver.

All in your day and mine! And, mind you, this attempt at monopoly was not created by weak men. It was created and controlled by giants, men who made the earth tremble. Yet it failed—wasteful in life as well as money.

It is probably the way of nature in controlling the affairs of men.

The nobility of France had a monopoly until its very arrogance and inefficiency fell before an avenging mob—a mob of men whose backs always bent to the whip of labor,

and who never thought a real thought without fear.

So it is with our banking system. It does give a few, great centralized power. And then the few foolishly waste it all, trying to build a babel of monopoly, only to find a confusion of tongues and a shower of ruin on their heads.

I think arrogance and indifference is the first break in the armor of monopoly.

After this rift, come inefficiency, carelessness and waste —and final smash of all discipline, and then the deluge.

Monopoly never seems content to mind its own business. It is the busybody of the world.

Not only does it want its own business to run itself, but it insists upon debauching the whole neighborhood where it exists.

If you ever read "The Beast" by Judge Ben Lindsey of Denver, you will find the Rocky Mountain Bell (a monopoly) at the very fountain head of the interests that preyed upon the public and made a joke of the government of the community.

It seems that private monopoly cannot resist public demoralization—possibly because it is the shoal upon which monopoly is destined to wreck itself.

It does not matter what promises are made, or how near Utopia we will be, when one grand and universal system controls all. We can't keep the microbe of destruction from gnawing at its very vitals.

Monopoly seems to be as a pyramid with its apex downward. The heavier the load becomes, the more unstable the structure becomes.

Instead of having the great broad base of the pyramid on the ground, it goes higher in the air as its opportunities increase.

Will the banks refuse to co-operate? Will they stand idly by and force the public to go into the banking business, so that thrift and industry shall get its proper share of encouragement, and enable us to build a pyramid of prosperity, one with its base on the ground?

It is safe to say that their bluff will be called. And it's safer to say that they will jump into line so fast that you will think it is a stampede.

Why would banks or bankers or any group of men care to continue fostering a system which creates New Haven fiascos.

Why would anyone deliberately butt his head against a stone wall? Monopolizing the railways of New England was exactly like butting one's head against a stone wall. Besides, no bank nor group of financiers will get much credit out of the New Haven matter.

They have safely gotten away with the commissions of monopoly. But they are merely strangling the goose which lays golden eggs.

That trick seems habitual with the modern financier He acts a great deal as the boys who cut up the vines while stealing the melons.

Grabbing everything available, and destroying everything not immediately useful, has even destroyed armies—much less railroads. Likewise grabbing telephone companies which do not pay and which never will pay, all in the name of monopoly, is just as vicious and unwise.

It is much better to have helpful allies, themselves on an earning basis, than to have it all, even on a good basis.

It is plainly seen that the Bell company is aware of this situation. Their advertised 3,000,000 connected stations shows that they really do not care to destroy the vines.

Nothing would cripple the Bell company more than the act of buying out these 3,000,000 connected stations.

Very few of them earn $40 per year—and every one of them the Bell company takes over, which earns less than $40, is a case of killing the goose.

What is the use of buying up a telephone company earning an average of $20? It is a sure thing that the rates cannot be doubled. Besides, long distance rates are now being criticized.

As I write, I have a clipping on my desk showing the struggle of the Pacific Bell against lowering its long distance rates.

Its attorney confessed that the rental rates were already too low, and that the dividend on $18,000,000 preferred stock was threatened.

Now you have an illustration: The Pacific Bell is a monopoly seeker. It has bought everything it could—trying to kill off every competitor—and today stands confessed that it cannot longer hope to pay dividends on $18,000,000 preferred stock—representing real money too.

The Bell company, in trouble in so many places regarding rates, still goes on weirdly buying. It's hard to understand.

The new currency bill strikes at the root of monopoly by striking at stock gambling and encouraging industry and commerce; by taking private credit away from a monopoly and giving public credit its place.

Then you and I need feel no future terror, because we know that the hand of private credit cannot longer be wielded by our monopolistic competitors and that in time of stress, you and I may have money to steer us through the whirlpools, without ruin to an inoffensive group of stockholders.

The very enemies of the currency bill should make even the children cry for it, because the children will soon grow up and will not be compelled to be clerks of a great jelly fish organization.

You and your children are interested in the death of the monopoly of private credit—and the birth of a public credit institution should give you new hope.

We may yet name the day upon which this bill is signed, as a holiday.

Will they make good on their bluff? Will 7,500 national banks surrender their charters? I will make you a wager: The growth of the national banks will be greater than ever.

A few may make good on their bluff, but there will be many people, ready to buy their charter and begin business.

Did you know that national bank charters are getting hard to obtain. They even have an asset value.

If you have managed to read this far, be assured that the world will keep wagging on and purging itself of boils and other excrescences.

MORAL: The best medicine is often the bitterest.

Central Union Denies Jurisdiction of Indiana Commission.

The Central Union (Bell) Telephone Co. has filed with the Public Service Commission of Indiana its answer to the petition of a citizens' committee of Anderson asking for a readjustment of telephone rates in Anderson. The Central Union Telephone Co., in its answer, questions the right of any state commission to interfere with its business rates, on the ground that its business is interstate.

Depreciation as Applied to Public Service Utilities

Theory of Telephone Expert of Oklahoma Corporation Commission for Setting Up and Making Specific Separation of Reserve for Loss Sustained Through Extraordinary Repairs, Obsolescence or Inadequacy—Paper Presented at Meeting of Oklahoma Telephone Association

By George P. Player

Superstition has always governed, to a large extent, the actions of persons. "The spook" was a part of the old time negro's life; he believed in it religiously for the reason he had been taught in it; not because it was actual or representative, but simply because he had been led to believe it did actually exist, just as the utility operator believes in the application of the word "depreciation." The misapplication of this word has been directly the cause of more litigation than any other one thing. The contention for an amount to cover loss, existing largely in theory only, has been recognized by the highest courts and, in nearly every individual case, has been allowed despite difference of opinion and absence of facts.

George P. Player.

The proper application of the term "depreciation" to the property of a public service utility has not, as far as the author can at this time observe, been made. The practice of applying the term is considered justifiable, for the reason it has always been used. An amount charged off as depreciation is considered necessary, but in a large measure the charge is made without the operator knowing the reason for, or the result of, such a deduction.

The distinct scource of drain on the revenues of a utility plant is maintenance, subdivided into daily repairs, extraordinary repairs and replacement. The term daily repairs is understood. Extraordinary repairs are caused by storms and unforeseen accidents and replacement is caused by obsolescence and inadequacy.

A clear understanding of the words depreciation, obsolescence, and inadequacy is necessary so that the operator might make his deductions consistently.

Depreciation means the act of lessening or seeking to lessen price, value, or reputation; the falling of value; the reduction of worth.

Obsolescence means the state of becoming obsolete and obsolete means no longer in use; gone into disuse.

Inadequacy means the quality or state of being inadequate or insufficient.

The making of a charge of some nature to enable the operator to reserve sufficient revenue to maintain his plant, is simply a question of correct accounting and this statement will contain the author's theory for "setting up" and making specific separation of a reserve account to be used by telephone companies in caring for property on which a loss has been sustained through extraordinary repairs, and replacement due to obsolescence or inadequacy.

The Reserve Fund and Its Amount.

The reserve fund should at no time exceed 10 per cent. more than the actual expenditures for the units classed thereunder; than was expended for the same class of repairs, etc., as shown by past experience to be necessary. The reserve should be established on an interest bearing, sinking fund basis and should draw interest not to exceed that which is paid for money borrowed. Whenever the reserve exceeds the amount allowed, the surplus should be credited to operating expenses.

It has been the policy and theory of all telephone companies, up to and inclusive of the present time, to keep their plants in standard condition and repair, charging the cost to current revenues, and in the majority of cases, charging off, in addition, a certain percentage on the entire plant for depreciation.

The charges made for so-called depreciation have, to a large extent, been for additions and betterments to existing plant, and not wholly for parts of the plant which have been obsolete. Proper separation of the reserve account should be established with proper sub-divisions. Each such sub-division should be charged with the cost of making repairs, etc. to the units classed thereunder.

A reserve account should be set up to care for extraordinary repairs due to storms, fires or other unforeseen happenings which would destroy, completely or in part, any parts of the plant in service. The account should be subdivided as to apply to central office equipment, subscribers' stations, aerial plant and underground plant. The charges made against this account for any parts of the plant should be debited with the full cost of such parts destroyed, and credited with whatever salvage is obtained.

The Reserve Fund for Obsolescence or Inadequacy.

A reserve should be set up under a heading for replacement due to obsolescence or inadequacy, and sub-divisions made for various parts of the plant as under extraordinary repairs. Replacement due to obsolescence or inadequacy is caused to perform the functions which are required of it at a certain time. Beyond question, with perhaps the exception of some minor equipment, there is considerable salvage on all parts of the plant. For example, take a 40-ft. pole, which is ordinarily estimated to have a life of 12 years, and place it in service for a period of eight years. The cost of such pole delivered in central Oklahoma is $10.56. The cost of labor for putting the pole in place, including shaving, framing, digging the hole, hauling, etc., is $3.14, making a total cost of the pole in place of $13.70. The cost of removing this pole, and laying it on the ground, would be $1.68, making a total amount which this pole has cost of $15.38 in eight years' time. Out of what was originally a 40-ft. pole, by cutting off that part of it which has rotted away, usually about five feet, a 35-ft. pole is obtained, which, for all purposes, would be as good as new. Therefore the salvage of the 40-ft. pole should be the cost of a new 35-ft. pole, laid on the ground, which is $7.52; plus the cost of shaving and framing, 39 cents, making a total of $7.91 which should be placed to the credit of the 40-ft. pole removed. In making this credit the loss on the 40-ft. pole in eight years' time would be $7.47. This would equal depreciation at the rate of 4.857 per cent. per annum, with a salvage value of 51.40 per cent. Central office equipment, subscrib-

ers' stations, and furniture and fixtures should be taken care of through this reserve account and their percentage in value estimated at the time of replacement.

There are certain parts of the plant which have no salvage value. For example, 20 ft. poles and all poles under a length of 20 feet, anchors, cross arms of various sizes, and other parts of plant having an estimated life. The renewing or replacement of such parts, should be taken care of through this account.

In all cases before the Corporation Commission, where the question of depreciation has been raised, the writer has stated that no depreciation should be allowed on any parts of the plant, except interior equipment and furniture and fixtures, for the reason that the telephone companies are keeping their plants in standard repair and condition from day to day and charging the cost of such directly against revenue.

Minor parts of the plant which come in for need of daily repairs, such as broken wires, necessary adjustments of subscribers' stations, central office repairs, and repairs to minor parts of equipment, must be charged as maintenance expense against revenue. But to charge the replacement of various parts of the plant directly to revenues would, if an amount for depreciation were also allowed, cause a double charge against revenue. There is but one way for an operating company to maintain its plant; that is through its receipts. No one would contend that new capital must be injected into any utility in order to maintain it. Such procedure would be absolutely ruinous and would not represent in any sense a true condition.

When average life has been ascertained, the method of treating replacement (depreciation) so as to justly and equitably apportion it among the different consumers during the entire life of the unit must be determined. Several methods are possible. One, considered generally best and simplest in application, is the sinking fund method.

SINKING FUND METHOD OF TREATING REPLACEMENT.

The sinking fund method is, briefly, that the consumers shall pay to the company each year such a sum as will, when invested at compound interest, amount with the interest accretions at the end of the estimated term of life of the property in service, to the amount of the investment.

Elementary principles of depreciation are not well understood by the public generally and therefore a concrete illustration will probably make the matter plainer.

Assume that certain unit of plant life costs the company $100 and has a useful life in service of 10 years with no salvage value. The company is entitled to have, and the public should pay, a return, of say 6 per cent. each year, for the use of the money invested, or $6. It is also entitled to have its $100 returned to it at the end of 10 years. By the sinking fund method, it gets the $6 each year for the use of its money, and also the sum, which, invested, at say 4 per cent. compounded, will at the end of ten years amount to $100. This sum would be annually $8.23. The public should therefore pay on this basis $14.23. Of this amount $6 would be for the company's dividend and $8.23 would go into sinking fund; and the company would get no benefit therefrom, except at the end of the term, when the entire fund would be used in replacing the unit.

This method for replacing property makes the annual payment made by the public less each year for the destruction of capital, for the reason that the public the first year has to pay for destruction only such a sum as, placed at compound interest, would amount to the proportion which it ought to pay of the $100.

This principle of caring for replacement was applied by the Public Service Commission, New York Second District, in the case of Fuhrmann vs. The Cataract Power & Conduit Co. Deductions made from net earnings in the findings for replacement are termed obsolescence and inadequacy, not depreciation.

Extraordinary repairs and replacement due to obsolescence and inadequacy can all be called depreciation, but the fact remains that the term as generally accepted does not reveal true facts and therefore a reserve account, properly sub-divided, should be set up.

Meeting of Executive Committee of Missouri Association.

A meeting of the executive committee of the Missouri Telephone Association was held at Jefferson City, Mo., on September 16. Those attending the meeting were as follows: Houck McHenry, of Jefferson City, chairman; Ed. A. Hook, of Appleton City, secretary; William H. Bassett of St. Louis, representing the Kinloch company; Dr. S. T. Neill, of the Missouri Union Telephone Co., of Clinton; M. L. Golladay of the Holden Home Telephone Co., Holden; R. A. Guthrie of the Macon Telephone Co., of Macon; A. R. Boutin of the Cape Girardeau Bell Telephone Co., of Cape Girardeau; G. V. Ross of St. Louis, representing the Bell Telephone Co., and J. A. Hudson of the Columbia Telephone Co. of Columbia.

The chief business considered by the committee was the establishment of a permanent office in Jefferson City, to be in charge of Secretary Hook. The object of this is to keep the telephone companies operating in the state advised as to the rulings made by the Public Service Commission from time to time, the construction placed by that body on various phases of the law governing telephones, etc. The committee believes that this office will be of great advantage both to telephone men and the commission. The office will be established at once and through it the commission will be able to keep in close touch with all the telephone companies in the state.

Industrial Welfare and Efficiency Convention.

John Price Jackson, commissioner of the new state department of labor and industry of Pennsylvania has called a convention known as the Pennsylvania Industrial Welfare and Efficiency Convention to enable the heads of the state departments, engineers, manufacturers, labor and others interested in the cause of industrial welfare and efficiency to discuss these topics together and to suggest legislation and other means of bringing about co-operation and better understanding of industrial conditions by the various interests involved. The convention will be held in the halls of the capitol building at Harrisburg on October 28, 29 and 30 and will be under the auspices of the Engineers' Society of Pennsylvania.

Suit to Oust Bell Company in Des Moines.

The city legal department of Des Moines, Iowa, is reported to be making preparations to oust the Iowa Telephone Co. from the city streets through an old case brought by the state on relation of W. T. Shaver. The ground for the action is the claim that the company's franchise has expired and that it is occupying the streets without authority. The telephone company contends that it is not subject to municipal control for the reason that it operates under authority granted by the state legislature.

The city is also about to bring action to compel the Iowa Telephone Co. to pay the city $40,000 annually as rental for the poles and wires in the streets of Des Moines.

Two Additional Operators to Say "Please."

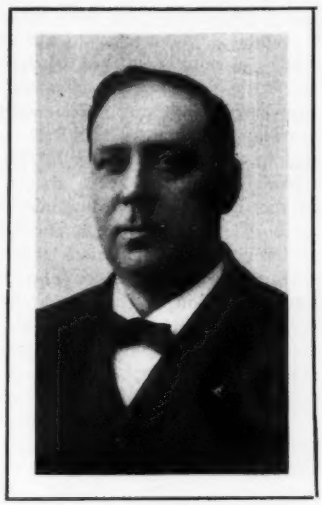
The word "please" recently added to the vocabulary of the telephone operators of the Nebraska Telephone Co., has necessitated the employment of two extra girls in the company's offices at Norfolk, Neb.

A Quartet of Men Prominent in the Telephone Field

CHAS. W. ROBERTS, pioneer Independent telephone man of West Texas, was born in Clarksville, Tenn., May, 1852, and attended the common schools until the Civil War began. He resumed his schooling in 1867 and attended the Kentucky University for a portion of 1868-9. While a clerk in a country grocery store, he kept books at night, became freight check clerk for the L. & N. R. R., learned telegraphy and was given charge of a small telegraph office. He went to Austin, Tex., in 1875. He was connected with the Abilene Telephone Co. from its inception in March, 1895, to April 5, 1902, when it incorporated as the Roberts Telephone & Electric Co. He was respectively owner, president and general manager of the company until October, 1907, when after a receivership it became the Abilene Independent Telephone & Telegraph Co. He remained with the company until he became special contract agent of the Southwestern Telegraph & Telephone Co., which position he held until September 1, 1913, when the Bell's Abilene exchange was sold to the Independent company.

ALFRED S. METZNER, director, secretary and general manager of the Home Telephone Co., Jacksonville, Fla., was born at Louisville, Ky., in August, 1877, and was educated in the common schools and at the Kentucky Normal College, Lawrenceburg, Ky. Mr. Metzner was a cigar salesman for 16 years, up to 1908, and then became a wholesale dealer in cigars at Jacksonville, Fla., in which business he was engaged up to September, 1912. He had become impressed with the need of a local telephone system in Jacksonville, and he finally decided to enter the telephone field himself. He applied for a franchise and the matter was submitted to a vote of the citizens. At an election held in September, 1912, he was granted a franchise for the construction and operation of an exchange in Jacksonville. He thereupon organized the Home Telephone Co. and transferred the franchise to that company, of which he became director, secretary and general manager. He then engaged in the construction of a local exchange and telephone system and has since remained in charge of its operation.

W. W. LOW, president of the Electrical Appliance Co., Chicago, Ill., was born at Flint, Michigan, in October, 1858. His early education was in the public schools of Flint, and his first efforts in business were directed along mechanical and manufacturing lines. Going to Detroit in 1884, he began service with the Detroit Electrical Works. In 1887 he became connected with the electrical supply business in Chicago, holding a prominent position for some years with the Central Electric Co. In 1891, with Thomas I. Stacey, he organized the Electric Appliance Co. and has been president of this company since its organization. This company has been prominently identified with the handling of telephone supplies, and at the height of the Independent telephone movement, was one of the most conspicuous telephone supply houses in the country. Mr. Low has been a prominent figure in telephone conventions during the past 20 years. He is a Mason, a member of the Chicago Athletic Association, Chicago Motor Club, and South Shore Country Club.



WILLIAM H. CRUMB, president of W. H. Crumb & Co., engineers and contractors, First National Bank Building, Chicago, was born in Chicago in October, 1872, and was educated in the Rockford, Ill., high school and at Cornell University. Mr. Crumb was employed by the Central Union Telephone Co. in 1895 and continued with that company as construction engineer until 1900, when he accepted the position of general superintendent of the Pittsburgh & Allegheny Telephone Co. He remained in the latter position for one year and in 1901 became president of the company which bears his name, engaged in general telephone engineering and contracting. Mr. Crumb constructed the plants at La-Porte, and Lafayette, Ind., Newark, Ohio, Sioux Falls and Yankton, S. D., Hot Springs, Ark., Belvidere, Ill., Ishpeming and Marquette, Mich., as well as toll lines in Arizona, North Dakota and Idaho. He served the city of Chicago on a special telephone commission in 1907 and the city of Louisville, Ky., in 1908. He is a member of the Western Society of Engineers and associate of the American Institute of Electrical Engineers. He is a Mason.

Telephone Service Standards Result of Wisconsin Hearing

Conference at Madison, Wis., Called by Wisconsin Railroad Commission, Attended by Representatives of Independent and Bell Companies of the State, Who Discuss Commission's Proposed Rules Establishing a Standard of Telephone Service—The Rules as Concurred in

Standards of telephone service to be promulgated by the Wisconsin Railroad Commission were discussed at a public hearing held upon call of the commission at Madison, Wis., on September 23. The meeting was attended by about 50 representatives of telephone companies operating in Wisconsin. Notification had been sent to every company in the state. The meeting was considered of so much significance by the Bell company that it sent members of its New York staff. The Chicago and Milwaukee officials of the Bell were also represented, and practically all the Independent companies in the state sent delegations. David Harlowe of the commission, presided at the conference and was assisted by Chief Engineer C. M. Larson and Chief Inspector John N. Cadby of the telephone service division of the commission.

Tentative rules governing telephone service were first made public last February during the meeting of the Wisconsin State Telephone Association at Madison. These rules, which were prepared by John N. Cadby, were discussed in all their phases at the meeting this week with the object of gaining the best standards that the combined knowledge of the operators and the commission's engineers might bring forth. The representatives of both the Bell and Independent companies joined heartily in approving the plan. It is expected that Wisconsin will be the first state to adopt such rules.

The proposed rules as modified by the suggestions of the telephone men and which were taken under advisement by the commission, are as follows:

EQUIPMENT AND CONSTRUCTION OF LINES.

Rule 1. The equipment and lines of all telephone utilities shall be so constructed and maintained as to eliminate, as far as possible, all cross talk and objectionable noise on the line, and to insure good transmission of messages.

Rule 2. On new construction not more than 12 subscribers shall be connected to any one line having a length not exceeding 10 miles. On longer lines this number may be exceeded with the consent of the state railroad commission. Present lines having more than 12 subscribers connected should be reduced to comply with the foregoing as promptly as possible.

Rule 3. Any telephone company giving service between any two incorporated cities or villages should maintain at least one line between those places to which no subscribers' stations are connected.

Rule 4 Each telephone company shall make such tests and inspections as may be necessary to insure that its lines, stations and other equipment are maintained in condition for rendering edequate service. Local batteries should be inspected and when found to be defective attention should be called to them or they should be replaced.

Rule 5. An exchange shall be considered as giving reasonably prompt service when 94 per cent. of the calls are answered by the operator in 10 seconds or less. Small exchanges, however, will not be expected to handle calls as fast as that. Operators should follow up calls with reasonable care and disconnect promptly after conversation has closed.

EQUIPMENT OF CENTRAL STATION.

Rule 6. Each exchange shall have sufficient switchboard capacity and operating force to handle the traffic with reasonable facility. Sufficient traffic studies shall be made by each utility to provide for necessary extensions and to demonstrate to the state railroad commission that sufficient equipment is in service.

Rule 7. Reasonable effort shall be made by each telephone utility to provide for meeting all emergencies such as failure of lighting or power service, sudden increase in traffic, illness of operators and other emergencies which would seriously affect the service were these provisions not made. Small companies should have proper night bells.

Rule 8. Each telephone company serving 250 or more subscribers should adopt suitable rules and instructions covering the phraseology and methods to be employed by operators in handling regular and special calls.

INFORMATION AND TREATMENT OF SUBSCRIBERS.

Rule 9. Telephone directories of exchanges of over 1,500 subscribers shall be revised at least semi-annually, and those of all others at least once a year.

Rule 10. Each telephone company should publish in its directory or otherwise such instructions as may be necessary to inform subscribers what action they should take in order to obtain efficiency and adequate telephone service from its system.

Rule 11. Each telephone company should provide at pay stations, in its directory, or in another suitable manner such instructions as may be necessary to inform patrons as to the action they should take in order to obtain efficient and adequate telephone service from its system.

Rule 12. Each exchange shall maintain a record showing all complaints, interruptions or irregularities of the service which shall include the date and time the trouble is reported, the nature of the complaint or irregularity and the duration of the irregularity. All reasonable effort shall be made to eliminate interruptions or irregularities and to promptly take care of all complaints or irregularities which may arise.

Rule 13. In order to facilitate the enforcing of these standards each telephone utility shall file with the state railroad commission and announce to all subscribers, the name and address of the official responsible for the quality of service furnished. Co-operation of subscribers is to be solicited in securing prompt answering, courtesy and adequate service.

Before final adoption the rules will be considered further at another conference to be called by the commission in about two months. It is planned that modification of the rules may be ordered where reason demands it.

Prominent in the discussions were the following: K. W. Waterson, traffic engineer of the American Telephone & Telegraph Co., and William Christensen of his staff, New York; J. G. Wray, chief engineer, and Albert P. Allen, Chicago Telephone Co.; W. D. Dakin, central group, Bell company, Chicago; H. A. Seymour, general manager, and F. H. Lincoln, traffic manager, Wisconsin Telephone Co., Milwaukee; Frank L. Eldridge, manager of Telephone Service Association, Chicago; Senator H. L. Teasdale, Sparta Telephone Co.; Senator W. W. Albers and N. Heinemann, Wausau; Walter J. Gallon, manager Citizens' Telephone Exchange, Sheboygan; P. J. Weirich, secretary of Wisconsin Independent Telephone Association, Monroe; J. C. Crowley, manager People's Telephone Co., Superior; W. L. Smith, secretary and treasurer Badger State Telephone Co., Neillsville; A. V. de Neven, M. D., County Line Telephone Co., Tisch Mills.

Protest Against Rate Increase at Conway, Ark.

Telephone subscribers at Conway, Ark., through a petition that has been circulated, have requested the city council to take steps to prevent a contemplated increase in local telephone rates which it is declared will amount to an aggregate of $24,000 per year.

The Rejuvenation of the Craneville Telephone Exchange

A Serial Story Begun in the August 16 Issue, Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged and Changed Successively from a Grounded to a Local Battery Metallic System and Later to Common Battery

By Paul Hamilton

The morning following the discussion of office records, Frank left his garden a little earlier than usual, carried away by his enthusiasm to begin actual telephone work systematically. By the time Mr. Barrows arrived at the exchange, Frank had copied the code system into his book, so far as it had been given to him.

"Good morning, Frank. I see everything is brushed up and shipshape. You must have come down early?"

"No sir," answered Frank. "I've been here about ten minutes. The 'medic' took a notion to sweep and brush up this morning. He appreciated his night off, I guess."

"Glad of it. We're lucky to have a fellow like him for night man. We must find out what his prospects are for staying the year out." After busying himself a few minutes about the room, Mr. Barrows resumed.

"We had better take up the exchange code before things liven up, and then we will be ready to take up matters of general improvement. For exchange trouble, we will begin at 71. I haven't completed the list, but will ask you to name over the most common troubles you find."

"All right. Take drop adjustment first," and Frank named a number of troubles which Mr. Barrows took down, giving code numbers to them.

(71). Drop adjustment.
(72). Dirty jack contact.
(73). Jack adjustment.
(74). Fuse open.
(75). Wire broken at jack.
(76). Wire broken at drop.
(77). Wire broken at rack.
(78). Cord open.
(79). Plug broken.

"I guess that is a majority of them," concluded Frank after a pause.

"I think they will be enough to start with. What fuses do you refer to?" inquired Mr. Barrows.

"Over there behind the rack are three strips of fuses, one for each drop. Some of the fuses have been replaced with wire, as we have no more fuse wire," Frank replied.

"As that is all the office protection we have," commented Mr. Barrows, "the wire must be replaced at the first opportunity. Now the next thing for us to decide upon is what is the most important thing for us to take up first."

"Well," Frank replied, "that is hard to say. There is no part of the plant that does not need attention."

"Admitting that, what is in the greatest need of attention?"

"There is little difference between the condition of the lines and the instruments," Frank replied.

"That being the case, we must find a reason for giving one or the other the preference," Mr. Barrows responded.

"As far as that is concerned, the instruments might be given preference. That class of work will be more noticeable to the subscribers," said Frank.

"I see you have caught the idea of regaining the confidence of the public. Half a dozen men at work on the poles would not have the effect of one man going from house to house," Mr. Barrows commented.

"I think you are right. Will a house to house inspection, taking them as they come, be satisfactory?" Frank inquired. "There is no way of estimating how long that would take."

"No, I do not think we should take it up in that way. There are, I suppose, many well known and influential people here; women interested in various clubs and societies, who use their telephones to a considerable extent?"

"Yes, I can name a good many such," Frank replied.

"Then there are a number who make frequent complaints?"

"Yes, we have a dozen chronic kickers," responded Frank.

"We will not call them that for if we consider them that way, we are inclined to make light of their complaints and overlook something that may be the real cause. Then there are the telephones in business places. Perhaps attention in that direction would help us to keep the ship going until we get reorganized—take the banks, the newspapers and the larger stores, for instance."

"If we take up the business district first, we can perhaps get some of the line wire replaced, as the lines are short for the most part," suggested Frank.

"Well, let us begin with the newspapers. They may become interested enough to publish a comment of some sort," Mr. Barrows decided. "There are three, I believe, with five telephones besides the editors' residence telephones. I have ordered 200 dry cells which should arrive by today's freight. There are some sal ammoniac cells in service, I believe?"

"Yes, I have been using sal ammoniac batteries for renewals lately as Mr. Rankin considered them cheaper and better," Frank replied after answering two calls at the board.

"I see," commented Mr. Barrows, "that nearly all the calls are made by name. As soon as we can get directories printed, we will try to change that and have subscribers call by number. But we will take that up later."

"We haven't had a directory so far as I remember and it will perhaps be useful in letting everybody know that we are waking up," replied Frank.

"I intend to use it very much for that purpose. Now to go back to the instrument problem. I have about decided to order some instruments of a new type to replace the old ones when it is necessary," the proprietor advised.

"Do you want my opinion of that?" Frank inquired.

"Certainly. What is your idea?"

"Well, I believe it would not be advisable to get the new type unless you intend to make a complete change. It will add to our troubles, for everyone will be clamoring for new instruments," Frank replied.

"That is a good point. We are not quite ready to make a wholesale change. Some of the instruments will require changing, will they not?"

"That is certain. But I have an idea to take care of those cases," answered Frank. "There are about 25 instruments which have been taken out from time to time. Some of them are in fair condition. I think if we can select 10 from the lot, invest in a little furniture and metal polish, and shellac, we can give them a presentable appearance. We could even rewire them. All the work could be done in the storeroom upstairs more conveniently than on the subscribers' premises. As we bring others in, they can be gone over in the same way. If any new parts are needed, we can dismantle the old instruments upstairs, and get what we need."

Mr. Barrows watched his assistant as he answered several calls. His confidence in him had been constantly increasing. When Frank turned from the board, he was prepared to reply.

"Frank, I'm quite pleased with your suggestion. By acting upon it we will not find it necessary to buy any instruments until we are ready to change to a metallic

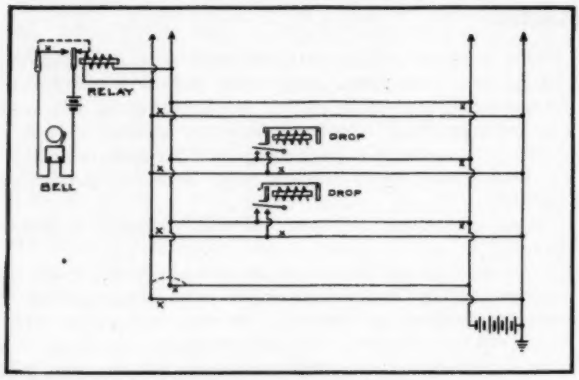


Fig. 9. Circuit of the Night Alarm.

circuit system. Now about getting these instruments in shape: How shall we manage that? I have many things to occupy my time for a day or two, and I see we have several cases of trouble to begin with this morning that will keep you busy."

"The trouble may not take me long and then again it may take all the forenoon," Frank answered. "I can get 'Germany' Dietz here this afternoon. He'll be ready to take right hold and go ahead. He wired instruments in Germany, and is a careful workman."

"Perhaps the money invested in labor will be better than in new instruments. By the time he has the instruments in shape, you and I will have found places for them. Whatever instruments we install, must be in the best possible shape.

"Good morning, Miss Dietz. Are you ready to begin at the board?"

"Good morning, I think so. I'm ready to try anyway," replied the red-cheeked young lady who came into the switchboard room just then.

"Well, Frank, I guess we have enough laid out for today. If you will show me where the alarm switch is, I will cut it in. Miss Dietz and I will try to get along until Miss DeLand comes to lend us a hand. You can start after the trouble."

"There is the switch," said Frank, indicating a switch at the end of the board. "It's a peculiar arrangement."

"Rather an ancient pattern, I should say, of what is known as a closed circuit type. It is considered more certain of action and for that reason is generally used for burglar alarms. An open circuit is satisfactory for our purpose and I think this can be changed with little trouble."

"It appears to be in trouble now. We will open off each bank of drops until we find in which bank the trouble is. I will assume that the battery is not open, although that should have been the first step."

"We're lucky this morning! The third bank at this end clears it. It is in one of the drop contacts."

After examining the board a few moments, Mr. Barrows made a sketch (Fig. 9) of the alarm circuit.

"It will be a matter of only a few minutes to change the present wiring to an open circuit. You notice the common leads are metal straps fastened to the frame of the board with small tacks. Nothing of that sort is done nowadays," Mr. Barrows explained.

"What changes will you make?" Frank inquired. "If you can show me on the circuit drawing, I'll not wait to see the work done."

"I can do that in a minute or two. First I will mount the relay horizontal. Then I will open the straps and wires at all points marked X. When I change the wiring, I will put in dotted lines (Fig. 9) on this outline. With the bell connected to the open or front contact of the relay, we must arrange the contacts at the drops to close the battery through the relay instead of 'shorting' it out. I will leave the circuit sketch here where you can get it, if the alarm gets into trouble."

"I'll leave word for Germany to come this afternoon," said Frank as he was leaving the exchange.

"All right," returned Mr. Barrows. "The first thing after dinner, we will put one of the instruments in shape and see if it will answer our purpose. After that I wish you would make up a list of supplies and material we will have to have."

"I may be back in time to do that this morning," and Frank started on his trouble trip.

(To be continued.)

Great Britain Telephone Development Slow.

The quarrel between the general postoffice of London and the telephone committee of Parliament which has been going on for two months, has reached its climax, says a London dispatch to the New York Times, through the publication of the correspondence that has been carried on between the committee and Herbert Samuel, M. P., the postmaster general. It will be recalled that the government assumed ownership of the privately owned telephone lines in England about two years ago.

An extract from the committee's first letter to the postmaster general reads as follows:

Great Britain remains in a position as regards effective telephone service in proportion to its population, inferior not only to such countries as the United States and Canada, but even to such similar countries as Denmark and Sweden. The rapid transmission of intelligence is now a commercial necessity of the first importance, and we see in the continued inferiority of our telephone service a serious handicap to our commercial progress. Not only are we seriously behind our commercial rivals, but we are not doing sufficient to improve our position in respect of them.

The expenditure on construction of trunk lines has fallen by one-third, from £371,000 to £225,000, in 1912, although new lines are urgently required to attract new subscribers and to increase the efficiency of the service by reducing delay in the trunk service. The number of new circuits added has also fallen, and this in spite of the fact that the natural demand for trunk services has increased with the number of local subscribers. The result has been to cripple the usefulness of the service and to prevent its normal expansion.

In 1903 the rate of increase of telephones was over 30 per cent., but it has steadily declined until now in London the increase is only 7 per cent. This result compares most unsatisfactorily with the great cities of America, where in San Francisco the increase is 24 per cent., in Montreal 18 per cent., and in Chicago 15 per cent. The total increase in telephones last year in the United Kingdom was only 38,000, as compared with 749,000 in the United States, which was much greater than the whole telephone service of this country.

We should, on a basis of population, have 3,000,000 telephones in England instead of 600,000 if we were to be proportionately in the same position as the United States, but at the present rate of increase it would take us fifty years to reach that position. We are so convinced of the vital necessity for restoring public confidence in the telephone service and increasing its efficiency that we ask you to consent to the appointment of a select committee to consider this year the question of rates, and next year the whole organization and administration of the telephone system.

If it is not possible to have such an inquiry here conducted by a select committee of the House of Commons, we suggest the formation of a permanent advisory committee representing the business interests of the subscribers in order to help the Post Office to meet the needs of the subscribers.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

September 15:—Complaints of Fraser and M. Sallee against the Southwestern Home Telephone Co. and the Pacific Telephone & Telegraph Co., dismissed because the rates complained of had been remedied to the satisfaction of the complainant. Complaints of John W. Reese and J. A. Hoag, dismissed for the same reason.

MICHIGAN.

September 17:—Hearing held at Lansing, Mich., on application of Citizens Telephone Co. to raise business telephone rates from $30 to $33 and residence rates from $20 to $22 as provided by ordinance when number of telephones exceeds 2,400. Decision reserved on plea of city officials that city council have opportunity to discuss the matter.

September 17:—Hearing held at Lansing on application of Dryden Telephone Co., Dryden, Mich., for permission to raise rates.

September 17:—Application of Nebraska (Bell) Telephone Co. to state commission and attorney general for an interpretation of the law limiting the hours of operators.

NEW YORK.

September 26:—Hearing by Commissioner Hodson, at Buffalo, on complaint of William De Courcy Rose against the Federal Telephone & Telegraph Co. concerning alleged discrimination in certain telephone contracts in Buffalo and delay in furnishing service.

September 26:—Hearing of Commissioner Hodson, at Buffalo, on application of Federal Telephone & Telegraph Co. for the determination by the commission of rates in Buffalo.

NEBRASKA.

September 15:—Application by telephone subscribers of Beatrice for a rehearing of the case granting rate increase by the Lincoln Telephone & Telegraph Co. in Beatrice. Motion overruled.

September 15:—Hearing held at Fremont by Commissioners Clark and Taylor on complaint of Hooper Telephone Co. against the Nebraska (Bell) Telephone Co. for refusal to furnish toll connections at Fremont.

OHIO.

September 18:—Order authorizing the Pataskala Farmers Telephone Co., of Pataskala, Ohio, to issue $6,000 of six per cent. preferred capital stock to discharge its promissory notes of this amount.

September 19:—Order in case of The Morris-Poston Coal Co. vs. The Harrison & Jefferson Telephone Co. requiring defendant to desist from assessing extra radius line charges for such portion of an established line between central and complainants business in Dun Glen as is within the corporate limits of Mt. Pleasant, Ohio, and fixing a rate for individual extra radius line service.

SOUTH DAKOTA.

October 8:—Hearing at Fairfax on complaint of the Farmers Telephone Co. to compel switching connections with the Nebraska Telephone Co.

WASHINGTON.

September 17:—Hearing held at North Yakima on a number of complaints involving telephone rates.

September 18:—Hearing held at Spokane on telephone rates.

To Attack or Not to Attack, That Is the Question.

Whether to attack the parent Bell company, the American Telephone & Telegraph Co., under the Sherman antitrust law is the question that is being considered by Attorney General McReynolds, according to a dispatch from Washington.

More complaints from Independent telephone interests that the Bell company is crushing competition have been received recently by the attorney general, who intimates that he must soon decide whether the department of justice shall await the conclusion of the pending telephone inquiry by the Interstate Commerce Commission, or undertake an investigation with the purpose of bringing a civil suit if the facts warrant such action.

The Interstate Commerce Commission's inquiry, undertaken at the request of Former Attorney General Wickersham, will probably require two or three years. The commission's investigation is designed to develop a governmental policy involving a decision ultimately whether the telephone should be owned and operated by the government or competition enforced under the Sherman law or whether the telephone companies shall be regulated by the commission, as the railroads are.

Ohio Commission Rules on Extra Radius Line Charges.

The Public Utilities Commission of Ohio has issued a ruling in the case brought by the Morris-Poston Coal Co., alleging exhorbitant rates by the Harrison & Jefferson Telephone Co. for service between the Mt. Pleasant central exchange and the coal company's mines and offices at Dun Glen, Jefferson county. The coal company complained that it was charged for telephone service at the rate of $18 per year for service at the Mt. Pleasant exchange and $68.75 per year for service over 12,150 feet of the defendant company's line, subject to a discount of 10 per cent. if paid in advance, making a net annual rate of $78.08. This rate, the complainant contended, was unreasonable, excessive and discriminatory.

The commission found the charge to have been computed on the basis of $18 per year for Mt. Pleasant exchange service; $27.50 for extra radius service at $5.50 per one-fourth mile for 5,850 ft. of line; and $41.25 for extra radius service at $8.25 per year for 6,300 ft. The first mentioned extra radius rate was in accord with the company's tariffs where "a line is extended beyond exchange boundary line and remains within territory receiving service without toll to exchange with which the line connects, provided the line wire can be strung over an established pole line and along other circuits occupied by this company." The second extra radius rate applied "if necessary to extend pole line a reasonable distance, or wire line beyond a point where this company operates its lines of wires over pole lines of other companies." The charges referred to were for one-party service. For two-party service the rates were $3.30 per year and for four-party service $2.20 per year per quarter mile in the first radius, and $5 per year and $3.30 per year, for two and four-party service respectively, per quarter mile in the second radius.

The commission found that the defendant company had included the whole of the line extending from the Mt. Pleasant exchange to Dun Glen as subject to the extra radius charge, and declared this to be unreasonable. It further found that the extra radius line should be measured from the corporate limits of Mt. Pleasant and that the extra radius line charge was excessive to the extent that it exceeded $4.75 per quarter mile.

The company was therefore ordered to desist from collecting the extra line charge for service within the corporate limits of Mt. Pleasant and was directed to "establish, assess and collect for individual extra radius line service, a rate which shall not exceed the sum of $4.75 per one-

fourth mile, or fraction thereof, for such communicating lines as it now has and operates, or may hereafter construct, acquire or reestablish and operate, which fall within its definition of such lines; the rates for two and four-party line services to be respectively $2.85 and $1.90 per one-fourth mile, or fraction thereof, per annum, respectively."

Beatrice, Neb., Subscribers Ask for Rehearing.

Telephone subscribers of Beatrice, Neb., who are opposed to the increase in rates of the Lincoln Telephone & Telegraph Co., in Beatrice, as authorized by the Nebraska Railway Commission, recently filed application with the commission for a rehearing of the case, which the commission has denied. Set out in the motion were the following points:

That the commission's physical valuation of the plant is grossly exaggerated. The present value of $182,848 is unjust, as $100,000 would be nearer the right figure.

That the commission did not inquire diligently into the values of the plant concerned and that the estimates and computations of the commission engineers were perfunctory and inefficient.

That the reproductive value of $234,099 was purely speculative and not based upon anything tangible.

That the 15.35 per cent. allowance for overhead charges, supervision is extraordinary, illegal and unjust.

That the statement of the manager of the Beatrice company that the value placed on the plant for taxation proposes, that is $75,000, should have been accepted by the commission and not the "stuffed" value, which the company gave for rate making ends.

That the commission erred in allowing the abolishment of four party business phones.

That the commission erred in allowing rate raises contrary to a contract entered into by the city of Beatrice and the telephone company.

Reappraisal Ordered for York County, Nebraska.

The Nebraska State Railway Commission held a hearing recently on an application of the Lincoln Telephone & Telegraph Co. for permission to increase rates in York county, Nebraska. The company acquired the Bell and Independent exchanges a few months ago and consolidated them. This reduced the number of telephones and the income with no reduction, it is stated, in expenses. This company desires to raise the rate of business telephones from $2 to $3 per month, with a residence rate of $1.75, or midway between the old Bell and Independent rates. The principal opposition was made by the farmers.

The engineers of the state railway commission reported that the company's property in service, is of a value of $350,000. The protestants insisted that it is not worth over $250,000 and that the engineers did not base their findings upon actual detailed examination of the plant, but upon theoretical assumption of costs and units determined upon before they viewed the property.

In view of this attitude on the part of the York county telephone users the commission consented to have a revaluation made by some outside engineer to be selected by the citizen's committee, the expense to be borne by the commission. The case was continued until a new appraisement can be made.

Nebraska Commission May Order Bell Prosecution.

Commissioners Clark and Taylor of the Nebraska State Railway Commission conducted a hearing at Fremont recently on the complaint of the Hoover Telephone Co. against the Nebraska (Bell) Telephone Co. for the latter's alleged refusal to furnish toll connection at Fremont. After the hearing Attorney W. J. Courtright was given permission to prepare the order of the commission, under instructions to write the order in whatever manner will get the case into court in the best way for an interpretation of the act of the last legislature requiring telephone companies to connect their lines for the interchange of messages. The dispute between the two companies in this case arises out of a failure to agree as to the proper division of receipts under the law. Commissioner Taylor, on his return from Fremont, was quoted in Lincoln as saying that the commission would either order the attorney general to prosecute the Bell company for refusal to make connection at Fremont or would issue an order to the two companies directing such connection to be made.

Are Operators at Work When Asleep in Nebraska?

The Nebraska (Bell) Telephone Co. has applied to the attorney general of Nebraska and to the Nebraska State Railway Commission for an interpretation of the law limiting the hours of operators to nine hours per day and 54 hours per week. Labor Commissioner Pool has held that if a girl is in the telephone building within call she is on duty under the law and the company desires a decision as to whether the time spent in the rest rooms constitutes service under the law. If so the company will be required to hire additional operators at an additional expense, it is stated, of $30,000 a year to keep within the law.

A question also arises as to the application of the law in small country exchanges where it is customary for night calls to be made only on emergency and where the operator can go to bed after attaching the night signal and sleep until awakened. The question is whether a night operator is at work, within the meaning of the law, while she sleeps.

Majority of Subscribers Threaten to Give Up Service.

Subscribers of the New York Telephone Co. in the towns of New Hartford and Whitestown near Utica, N. Y., are protesting against the toll rates into Utica. At a meeting of the subscribers residing in New Hartford a short time ago, the chairmen of the several committees engaged in circulating petitions, reported that 85 per cent. of the 313 subscribers in the district had signed the petitions and signified their willingness to have the telephones removed rather than to submit to the toll rate.

Of the number canvassed, four declined to sign the petition on the ground that they absolutely needed their telephones, but were willing to contribute to a fund to secure the abolition of the toll rate. A conference will be held later between a joint committee of the towns interested and Clarence W. Hitchcock, local manager of the New York Telephone Co. In case an agreement cannot be reached the matter will be brought before the Public Service Commission.

Attorney General Will Not Decide Chicago Query.

Attorney General McReynolds has refused to comply with the request of the committee on gas, oil and electric light of the Chicago city council for an opinion as to the legality of the proposed purchase of the Illinois Telephone & Telegraph Co. by the American Telephone & Telegraph Co. with a view of merging the automatic Independent system with the Chicago (Bell) Telephone Co. In a letter to Corporation Council Sexton of Chicago, the attorney general stated that under the law he was restricted in giving opinions on legal questions, such as the one involved, to the president and the heads of the various executive departments of the government.

Bond Issue of DeKlab County (Ill.) Telephone Co.

The DeKalb County Telephone Co., of DeKalb, Ill., has issued bonds in the sum of $100,000, the Pierce Trust & Savings Bank of Sycamore, Ill., being the trustee. Of this amount $60,000 will be issued at once for sale at par to take care of the indebtedness of the company and $40,000 will remain in the hands of the trustees for extensions.

Practical Subjects—Letters and Discussions

A Letter to the Chief Operator Who Cares.

Have few rules for your girls, but make them right to the point and see that you live up to them yourself. If you make a proper rule and break it yourself, then expect your operators to break it, unless they are stronger in character than you. When a rule is made, be absolutely sure that it is for the betterment of the service and not through some selfish motive of yours.

If you know your business, you will have your rules all established when your new operator goes to work. To make these rules work, you must work them. A few rules well worked are better than many unworked.

To have success with your operators, you must love them, which in the strictest sense means that you are to allow no evil thought to enter your mind toward them at any time. If you have never practised this, you will no doubt have some trouble, but cultivate this spirit and you will find in time that the girls with the proper material in them will be patterning after you. With no effort on your part, you will find fewer complaints coming from those portions of the board.

Remember that to control others, you must first learn the secret of controlling yourself. Not that outward control, but that which lies deeper, which will always take care of the other. Take no thought of the consequence, when in the proper spirit, you find it necessary to reprove. But woe unto to you if through a "will have my way" spirit, you endeavor to subdue the offending one with loud words. Remember that whatever your thoughts are toward your operators, these same thoughts will express themselves in a multitude of different ways, though you may be unconscious of it.

Study to direct your girls' thoughts into other and proper channels, when a difficulty arises. Teach them, if possible, the secret of thinking of things pleasant rather than to dwell on some unpleasant saying of some selfish subscriber. Teach them that a child easily forgets a harsh word and that they were once children and that this one gift should never be lost. Teach them that every angry thought has a sting in it. Remember that whatever your operators are, is reflected out over the lines and that you are responsible in a large measure for their conduct.

Do not allow yourself to worry over things you cannot help, for sometimes you will find it necessary to take on a "bunch" of bad ones, but don't forget that a "bunch" of bad ones is better than no "bunch" at all.

Never let your troubles get between you and those the girls may have. Always remember that theirs are bigger and need attention first.

Keep in the operating spirit by taking a busy position occasionally and working an hour, nothing will keep you in trim like being in actual touch with the subscribers whom you are trying to serve. See the task in hand as your operators see it, and you are always better prepared to settle difficulties.

Someone has said not to waste any time cutting specks out of rotting apples. But listen! Always be thankful that you can find apples with just specks in them. One can often cut out a speck and still have a fairly good apple.

Always remember that your operators' characters, as well as your own, are either going upward or downward, never standing still. If you find one growing cross, getting out of "sorts," study her case carefully before you say anything. Get your own thoughts on the upward trend. Know what is wrong and then apply the true remedy. A word hastily spoken will often crush a conscientious operator and cause her to leave the service later when you least expect it, while a careful study of her condition and thought, with the proper treatment may win her to you indefinitely. Be deliberate, thoughtful and careful.

With your own heart or thoughts right toward your operators, under all circumstances you can be reasonably sure of taking care of all difficulties in a proper manner. Don't take any trouble home with you, for you need all your time to recuperate for the next day's battle, which is truly a battle and no mistake.

The average manager knows little of the troubles which confront the operating force, except in a general way. If you can take care of your department troubles, do it, for usually the manager has his share too. Be kind to him, even though he may not be kind to you.

Don't try to make your work too easy, for this will invariably breed selfishness. Live for the girls who are under you and your work will become interesting.

If you must discharge an operator it must always be because she is detrimental to the service, never through an unkind spirit. Let her leave the office knowing fully that you have simply done your duty. Give her no chance to make it a personal matter. Later she will respect you for it.

Address your opeartors as Miss or Mrs. as the case may be, never by their first name alone; say Miss Hattie, Miss Nellie, etc. This is one of the grandest habits I know and will save much embarassment as the new operator becomes accustomed to her surroundings. This habit accompanied by the proper spirit will overcome a difficulty which many allow to wreck their efforts. Know that familiarity will oft times breed contempt.

Pull in lots of fresh air. Keep thinking of many good thoughts. Earn your salary and strive for character always upward. Let your motto be: "Without a battle there can be no victory, and without a victory there can be no reward."

Etna, Ind. Mrs. F. L. Whitaker.

Testing as a Means of Increasing Transmission.

By E. L. Lehman.

All have heard and read much about "telephone service," "service first," and the like, but after all it is "transmission" that telephone companies sell the public, because service without transmission, or with poor transmission, would have a struggle for life. Repeaters have been patented, and are being tried, in order to increase the range of transmission, but to date they do not appear to have been so wonderfully successful, commercially. Why not increase the transmission efficiency by stopping up the holes, or in other words, eliminating the small losses? A half mile here and a mile there, soon accumulate into miles of transmission losses.

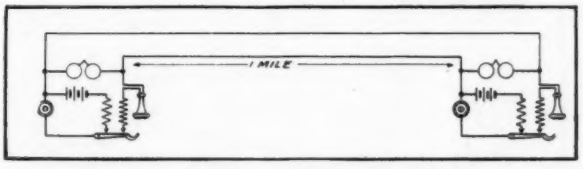


Fig. 1. Circuit for Maximum Transmission.

How many telephone men would think that the supervisory relay in the *A* cord circuit offers a high frequency loss of a third of a mile? And if the non-inductive winding should be open, the loss increases to about 2½ miles, using as a standard transmission mile, 88 ohms of resistance and a capacity of 0.054 microfarad. Such a small thing as a steel switchboard cord has a high frequency

loss of about four-tenths of a mile more than a tinsel cord.

Any telephone apparatus having resistance or inductance in series with the line, or bridged across the line, may have its loss expressed in transmission miles. With a line as shown in Fig. 1, the stations being one mile apart and

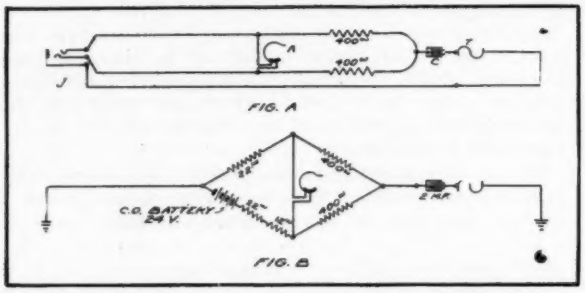


Fig. 2. Testing Box Circuit and Bridge Method of Balancing.

of low resistance and electrostatic capacity, a maximum of transmission would be obtained. But should an extension bell, a relay, or a repeating coil, etc., be inserted into the circuit, the transmission would be reduced in proportion to the impedance of the apparatus.

The subject of transmission efficiency is so large that only one way of increasing transmission will be explained. That is by testing, locating, and replacing apparatus in the cord circuit, which may not be standard or may be of inferior quality. Such cases may arise from the use of wrong relays in the supervisory circuit, or perhaps open non-inductive windings, unbalanced or high resistance coils and grounds or crosses, in the cord circuit. Fig. 2-*A* shows the circuit as arranged in the testing box. This box is placed on the keyboard when testing. The symbols *J*, *R*, *C*, and *T*, represent respectively the jack in which the cord under test is placed, the receiver or head telephone to detect any trouble, the condenser to keep the current from flowing while testing, and the tone or interrupted current, easily secured by a dry cell and buzzer. Fig. 2-*B* shows the Wheatstone bridge method of balancing the circuit when testing a cord circuit. When the tone is heard, the cord circuit is unbalanced.

In Fig. 3-*A* is shown one method of locating the trouble when holding an ordinary induction coil in the field of the relay. Should the relay be open in its non-inductive winding, a tone will be heard. Another method is shown in Fig. 3-*B*. When the relay winding is short circuited by a flexible lead, the circuit will be balanced. To locate repeating coil trouble, use the flexible lead to short circuit the coil, as shown in Fig. 3-*B*, at the coil rack. The cir-

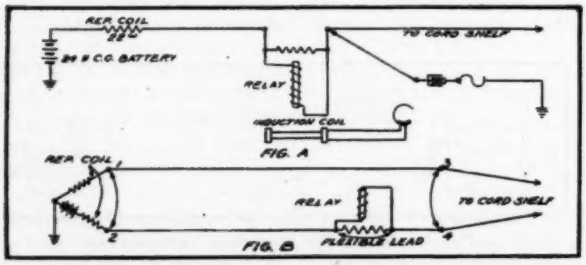


Fig. 3. Locating Trouble in Relays and Repeating Coils.

cuit will then be balanced, indicating a defective repeating coil.

The method of testing a repeating coil separately after removing it from the coil rack and before installing a good one in its place is shown in Fig. 4. If a coil should be of higher resistance than the standard, the transmission would be reduced through the current supply loss to the transmitter at the substation. If the coil were unbalanced, the loss would be in the coil. In either case, the coils should be replaced by coils known to be standard.

A ground anywhere in a cord circuit can be located by a voltmeter, and needs no explanation. Grounds on the cord circuit may occur and not be detected, as but few offices are required to make a periodic test on the talking circuit, that is the tip and ring or mate, and the line of a three-conductor cord circuit. Referring to Fig. 3-*B* it is evident that a ground at 2 and 4 would be detected immediately by an operator, because of the effect it would have on the supervisory relay. But if a ground should be placed on 1 or 3 or there should be a cross in the repeating coil, the effect on the transmission is obvious.

It would therefore seem to be good practice to make a periodic ammeter test on the most essential part of the cord circuit. The ammeter shows any difference in the current value of the circuit. The test could be made the same time that the third connection test is made, and should consume very little more time. It may be noticed that as the circuit, shown in Fig. 2-*B*, is not entirely balanced because of the resistance of the supervising relay or its equivalent resistance in the battery side of the 400-ohm coil, the balancing tone may be slightly reduced; how-

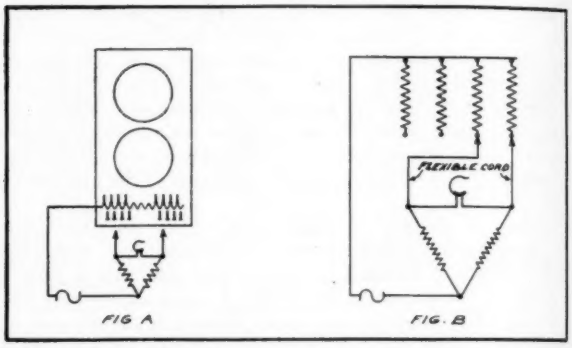


Fig. 4. Testing Repeating Coil When Separated from Circuit.

ever, it is not essential in order to obtain a test, but would have a little more value in locating, as the pitch of the tone would be higher. If the repeating coil were short circuited and the supervisory relay were open in its non-inductive winding, it would make considerable difference in the volume and pitch of the locating tone; therefore, when a short circuit is placed at the winding connections of the relay, the circuit would be balanced and the tone in the receiver lowered to its balanced volume. Because of the capacity of the wiring, the tone is not entirely eliminated when the circuit is balanced.

Rate Hearing at Oregon City, Oregon.

A recent hearing was held by the Oregon Railroad Commission at Oregon City, Ore., on the complaint of various councilmen of that city regarding the rates charged by the Pacific Telephone & Telegraph Co. The telephone company submitted figures showing a valuation of $70,712 for the Oregon City plant and on this basis requested that the rates be raised evenly to $1.50 for four-party and $1.75 for two-party residence lines, instead of being lowered to $1.25, which is said to be the rate fixed by franchise on a type of service that has been abandoned. The company asked an 8 per cent allowance for the depreciation fund and declared that the advance in rates was necessary to provide 8 per cent on the capital invested. This is said to be a test case which will affect many western Oregon cities.

Telephone Stations of the World at the Beginning of 1912

Some Interesting Statistics Showing the Approximate Number of Telephones in the Various Countries of the World as Compiled for the Post Office Electrical Engineers' Journal of London, England—Some Comparisons by Cities

By W. H. Gunston

To obtain precise statistics of recent date concerning the telephone systems of the world is a practical impossibility, while to obtain a reliable approximation is a matter both of patience and difficulty. So long as we are confined to Europe and Australia, where the majority of telephones are under state administration, and to Asia, where more than three-quarters of them are state owned, the task of obtaining statistics from six months to two years old is not an insuperable one. It is when we come to the continents where private companies predominate that press cuttings and diverse records have to be ransacked to obtain a trustworthy estimate of the present state of development in those parts of the world. It is not only that some private companies are not very willing to furnish statistics of their development, but also that in some states, as in the United States, Brazil, Mexico, and elsewhere, these companies are so numerous that it is almost impossible to apply to them all for information. However, in the United States the bulk of the telephones are operated by the American Telephone & Telegraph Co. and its connections. This corporation prepares for its own use admirable statistical returns, to which I am indebted for much valuable information. As regards Canada, the Dominion Government publishes a return of telephone statistics which includes those of private companies as well as of the state system. It is thus possible to obtain accurate figure for nearly the whole Europe and fairly precise figures for North America, which continents between them account for more than eleven-twelfths of the telephones in the world. As regards Asia, South America and Africa, the statistics I shall exhibit are qualified by estimates which will be duly designated. The figures obtained for Australia, Russia, Italy and some smaller states are those for January, 1911; estimated figures for January, 1912, are therefore resorted to.

Europe.	No. of exchanges.	No. of call offices.	No. of stations.	Pop'l'n (thousands).	Pop'l'n per telephone.
Denmark, March 31, '12	1,043	1,912	107,153	2,589	24
Sweden	2,201	3,125	199,690	5,522	28
Norway—					
(State, June 30, '11; private, Dec. 31, '10)	1,173	3,110	62,940	2,370	38
Switzerland	427	1,298	84,058	3,463	41
Germany	...	14,034	1,154,518	64,926	56
	6,798				
Gt. Britain & Ireland	2,808	12,674	701,082	45,365	65
Luxemburg	90	269	3,575	260	73
Iceland (est.)	...	...	900	78	86
Netherlands	796	1,246	65,314	5,945	92
France	9,341	15,562	260,998	39,252	150
Belgium	248	252	42,101	7,516	179
Austria	1,311	2,226	127,293	28,568	224
Roumania	945	3,212	19,438	6,700	298
Italy (est.)	...	...	76,000	33,910	446
	219	*1,048*			
Hungary	1,731	2,263	36,183	19,254	532
Spain	113	142	26,747	19,712	737
Portugal (est.)	...	...	6,900	5,423	786
Servia (est.)	...	.....	3,000	2,700	900
	34	*54*			
Russia (est.)	...	...	170,000	163,778*	963
	190	*592*			
Bulgaria	16	39	2,801	4,035	1,440
Greece	6	3	1,760	2,632	1,500
Bosnia-Herzegovina	20	25	802	1,828	2,279
Total in Europe	...	...	3,153,000	400,000	126

*Including Russia in Asia.

Table I—Telephone Development in Europe.

Asia.	No. of exchanges.	No. of call offices.	No. of stations.
Japan	856	2,508	159,675
Chosen, Formosa & Sakhalin (est.)	...	...	11,500
India	190	...	13,154
Netherlands, East Indies	149	40	9,735
China and Honk Kong (est.)	...	...	8,000
Indo-China (French) (est.)	...	...	900
Siam (est.)	...	...	700
Singapore (est.)	...	...	1,700
Total for Asia	...	...	205,000

Table II—Telephone Development in Asia.

EUROPE.—Table I shows the number of telephones in Europe and the proportion of telephones to inhabitants. It will be seen that Denmark, Sweden, Norway, Switzerland and Germany occupy the best positions in the order named, closely followed by Great Britain, sixth on the list. The figures for Russia, Italy, Roumania, Servia and Portugal have been estimated on the basis of the figures for the last two years. The figures in italics are those up to the end of 1910, obtained from the "Journal Telegraphique."

ASIA.—Japan and the British and Dutch Indies are the principal states using the telephone in Asia. The figures for those countries are official, the telephone stations of the remaining countries, which are unimportant in point of number, being estimated. It has not been thought necessary to show the relation of these few hundred thousand telephones to the millions of inhabitants of India, China and Japan.

America.	No. of exchanges	No. of stations.	Pop'l't'n (thousands).	Pop'l't'n per telephone.
United States—				
Bell	5,014	4,474,171		
"Bell-connected"	...	2,158,454		
Other Independents	...	1,725,000	92,174	11
		8,357,625		
Canada	...	302,759	7,152	23
Mexico—				
Ericsson Co.	12	7,889	...	..
Other companies (est.)	...	8,000	...	..
West Indies (est.)	...	17,000	...	..
Total North America	...	8,693,300	...	..

Table III—Telephone Development in North America.

AFRICA.—The most noteworthy telephonic development is in the Union of South Africa, where there are 18,672 subscribers' stations. Of these, 6,150 are in Johannesburg, 2,629 in Cape Town and 1,542 in Pretoria. Tunis has about 7,000

telephones. Those for Algiers are probably included in the total for France. In Egypt the system is in the hands of a company. Figures are difficult to obtain, but the total may be estimated at about 9,000. In Madagascar, Dahomey, French Guinea, Angola and the German colonies there are about 1,000 telephones, and the total for the whole of Africa, excluding Algiers, may be computed at about 36,000.

NORTH AMERICA.—Table III gives the figures for North America. Estimates had to be resorted to in the case of Mexico and the West Indies and of the Independent companies in the United States. The "Bell-connected" stations are those subscribers to Independent companies which have connection with the Bell system. With those of the American Telephone & Telegraph Co.'s sub-licensee, they total 6,632,625, and have increased by 749,906 since the beginning of 1911. The figures for Canada apply to June 30, 1912. Of the total stations, 148,543 belonged to the Bell Co. of Canada.

SOUTH AMERICA.—The telephone system of this continent is entirely in the hands of private companies, and they are numerous. Among the largest are the River Platte, the Monte Video and the Chili telephone companies, and those operating in Brazil. Statistics were obtainable only from the Monte Video company, which had 5,700 stations on its system on January 1, 1912, and from the Chili company, which had 11,700. The largest system is that of the River Plate company, which probably operates not less than 40,000 stations. There are also about 10,000 stations in the Argentine on the systems of local companies. In 1909 there were 39 different telephone systems in Brazil with 9,200 subscribers. Allowing for an increase of about 1,000 a year, it seems safe to assume that there were at least 13,000 telephones in the Republic at the beginning of 1912. There are also telephone companies operating in Peru, Ecuador, Venezuela, Paraguay and British Guiana. A pamphlet issued recently by the American Telephone & Telegraph Co. computed the number of stations in South America in 1911 as 85,700. A figure of 88,000 for 1912 will, therefore, not be excessive.*

Argentine Republic	50,000
Brazil	13,000
Chili	11,700
Montevideo	5,700
Allowance for rest of Uruguay, Peru, Guiana, Venezuela, Paraguay, Ecuador, &c.	7,600
	88,000

AUSTRALIA.—The figures furnished by the commonwealth are, as already stated, those for the beginning of 1911. It is, however, possible to arrive at a fairly accurate idea of the present development by basing an estimate on past progress.

	Beginning of 1910.	Beginning of 1911.	1912. (est.)
New South Wales	30,892	36,631	42,400
Victoria	21,418	25,350	29,100
Queensland	8,017	9,439	10,800
South Australia	6,179	7,410	8,600
Western Australia	6,611	7,239	7,800
Tasmania	2,494	2,737	3,000
Australia	75,611	88,860	101,500

The proportion of inhabitants to telephones at the beginning of 1912 was 39 in New South Wales, 37 in Western Australia, 46 in Vistoria, 50 in South Australia, 55 in Queensland, or 44 for the whole of Australia.

NEW ZEALAND.—The total number of telephones in New Zealand (including call-office stations) at March 31, 1912, was 40,598. Of these, 5,055 were in Auckland, 4,594 in Wellington, 4,106 in Christchurch and 3,761 in Dunedin. The average number of inhabitants per telephone was 25. The number of telephones in Australasia may, therefore, be put at about 142,000. From the foregoing the total number of telephones in the world may be stated as follows:

	January 1, 1912.
Europe	3,153,000
Asia	205,000
Africa	36,300
North America	8,693,300
South America	88,000
Australasia	142,000
	12,318,000

Table IV is believed to comprise all the cities in the world containing upwards of 10,000 telephones. The figures shown in italics are estimated, while those marked with an asterisk are made up of official "Bell" figures, to which an estimate of

City.	No. of telephones beginning of 1912.
New York	441,128
Chicago	279,383
London (with subs.)	220,782
Berlin (with Neukolln, Charlottenburg and Wilmersdorf)	177,854
Philadelphia	145,535
Boston (Mass.)	140,153
San Francisco	100,523
St. Louis	90,010
Los Angeles	86,922
Paris	84,489
Detroit	77,866
Stockholm	73,600
Cleveland	71,532
Pittsburg	71,249
Hamburg-Altona	64,935
Kansas City	57,934
Vienna	54,888
Cincinnati	53,594
Minneapolis*	50,270
Copenhagen (and suburbs)	48,301
Buffalo	46,951
Baltimore	46,428
Washington	43,972
Glasgow	41,310
Milwaukee	39,488
Toronto	38,184
Indianapolis*	36,000
Montreal	35,407
Buenos Ayres	*35,000*
St. Petersburg	*35,000*
Portland (Ore.)	34,338
Oakland	33,794
Denver	33,254
Tokio	32,557
Moscow	*32,500*
Seattle	32,300
Columbus*	31,700
St. Paul*	31,000
Liverpool-Birkenhead	30,596
Omaha	30,280
Munich	29,843
Manchester	27,917
Louisville*	25,500
Leipzig	25,489
Warsaw	*25,000*
Newark (N. J.)	24,485
Frankfort-on-Main	24,403
Rochester*	24,000
Providence	23,739
Toledo (Ohio)	23,000
Grand Rapids	*23,000*
Sydney	*22,000*
Dresden	21,885
Spokane	21,571
Budapest	21,388
Cologne	21,180
Melbourne	*20,500*
Dallas (Texas)	19,388
Winnipeg	19,000
Salt Lake City	18,831
New Orleans	18,783
Brussels	*18,500*
Jersey City	18,475
Atlanta (Ga.)	17,853
Stuttgart	17,782
Christiania (June 30, 1911)	17,361
Breslau	16,839
Birmingham	16,529
Düsseldorf	15,642
Syracuse (N. Y.)	15,335
Mexico City	*15,000*
Worcester (Mass.)	14,932
Houston (Texas)	14,913
Osaka	14,630
Richmond (Va.)	14,492
Amsterdam	14,341
New Haven (Conn.)	14,288
Springfield (Mass.)	14,230
Des Moines (Ia.)	14,167
Hannover	13,534
Hartford (Conn.)	13,475
Nuremberg	13,294
Edinburgh	13,243
Albany	12,826
Hull	12,347
Gothenburg	11,983
Zürich	11,956
Tacoma	11,827
Fort Worth (Tex.)	11,405
Norfolk (Va.)	11,324
Dayton (Ohio)	11,260
Bremen	11,056
Milan	*11,000*
Memphis (Tenn.)	10,809
Nashville (Tenn.)	10,742
Bradford	10,467
Newcastle-on-Tyne	10,245
Sheffield	10,114
Leeds	10,092
Duluth	10,008
St. Joseph (Mo.)	10,003
Rome	*10,000*

Table IV—Cities Having 10,000 Telephones or Over.

*A report from Consul Frederic W. Goding, Montevideo, which has recently been received in the office of TELEPHONY, states that the number of telephones in use in South America in 1912 was: Argentina, 68,547; Brazil, 21,264; Bolivia, 2,000; Chile, 24,482; Colombia, 1,700; Ecuador, 2,550; the Guianas, 1,220; Paraguay, 350; Peru, 3,800; Uruguay, 9,210; Venezuela, 4,568; a total of 139,691.

the number of "Independent" stations has been added. Of these cities, which number 102 in all, 69 are in America (64 in the United States), 39 in Europe, two in Asia and two in Australia. The figures for the British cities include the late National Telephone Co.'s private wire stations.

City.	Telephones.	Population.	Population per telephone.
1. Los Angeles	86,922	356,000	4.1
2. San Francisco	100,523	429,000	4.2
3. Stockholm	73,600	342,000	4.6
4. Omaha	30,280	162,000	5.3
5. Spokane	21,571	116,300	5.4
6. Salt Lake City	18,830	104,100	5.5
7. Dallas	19,388	116,200	6.0
8. Des Moines	14,167	90,100	6.4
9. Houston	14,913	95,000	6.5
10. Portland (Oregon)	34,338	228,000	6.6

Table V—Ten Best Developed Cities in World.

Table V shows the 10 best developed cities in the world. They are all American except Stockholm.

City.	Telephones.	Population (thousands).	Population per telephone.
Chicago	279,383	2,264	8.1
Boston	140,153	1,389	9.9
Philadelphia	145,535	1,592	10.1
New York	441,128	4,994	11.3
Berlin	133,867	2,296	17.1
London	220,782	7,160	32.5
Paris	84,489	2,846	33.7
Buenos Ayres*	30,844	1,190	38.6
Vienna	54,888	2,085	38.0
Moscow (est.)	32,500	1,359	41.8
St. Petersburg (est.)	35,000	1,678	48.0
Tokio	32,557	2,186	67.0

*Last year's figures.

Table VI—Telephone Figures in Cities of Over 1,000,000 People.

Table VI shows the telephonic development of the principal cities of the world with over 1,000,000 inhabitants.

Hearing on California Toll Rates.

At a recent hearing at San Francisco in the course of the investigation being made by the California Railroad Commission into the reasonableness of long distance telephone charges in California, Evans S. Pillsbury of the Pacific Telephone & Telegraph Co. declared that long distance rates are reasonable and that rates established by municipal bodies in California are, as a rule, too low. He contended that the rates should not be reduced on long distance service, although the system of making rates is open to change. Mr. Pillsbury continued as follows:

In all this inquiry an error has been allowed to persist. This is that 15 per cent. of the total charges made for long distance service should be absorbed by the local exchanges for their work. This margin is too small. The allowance should be 30 per cent. I know that this will allow the local rate-making bodies to set up new claims, but I am satisfied that the allowance of 30 per cent. for exchange work rather than 15 per cent. is about correct.

We are in a very bad shape at the present time, as to the making of rates. Rates in most of the cities are too low. The company as a whole is not earning 4 per cent. on its investment of property. Now, I am saying this irrespective of the stock and bond issues.

I dislike to allude to it, but this commission made a rule in the Wells-Fargo case that rates should be fixed to allow the company 10 per cent. net on its operating property. This commission should be consistent, and the Pacific Telephone & Telegraph Co. will be more than pleased to accept rates that will give us 10 per cent. on this operating property. We have been pulled down and down everywhere until we are not earning a reasonable rate on the investment.

I will go further. This commission has no jurisdiction over local exchange rates, but I do hope that the day will come when a central board will fix all rates, with a due regard to fairness to the company and regard for the rights of the patrons of the telephone service. Unfortunately, you cannot consider local exchange rates in this inquiry. I have no hope for the fairness of local regulation.

Commissioner Thelan smiled at this. "And very little hope for fairness from this commission?" he asked.

"I do not say that," replied Mr. Pillsbury. "But I will say that unless there is a stop put to the constant cutting of telephone rates, we will have difficulty in paying dividends on our preferred stock. This stock represents actual and realizable property."

"How much of your common stock amounting to $18,000,000, represents cash actually invested?" asked Commissioner Gordon.

"About $4,000,000 of it is in tangible property," replied Mr. Pillsbury. "If you want to call the rest of it water, you can do so, but it is represented by franchises and such things on which we pay taxes."

G. E. McFarland, president of the Pacific Telephone & Telegraph Co., testified that the reproduction cost of the company's property within the state of California was approximately $51,000,000, and that the present value of its holdings was probably 85 per cent. of that amount. He maintained that, should the commission's proposed rates go into effect, the company would earn only 2.23 per cent. on a valuation of $51,000,000, or about $1,250,000, within the state. These figures, he stated, made no provision for the interest charges on the $32,000,000 or 5 per cent. bonds outstanding.

Mr. McFarland testified, relative to the question as to what portion of the extensions had been built out of earnings, that the depreciation reserve of the company on June 30, 1913, was $9,012,999, and of this amount $5,952,416 had been allotted to California, and was now invested in the assets of the company. He further testified that $4,000,000 would be expended on construction work in the state during the present year.

Impartial Penalty Assessments in Michigan.

Under the ruling of the Michigan Railroad Commission that telephone companies cannot discriminate in telephone charges, such as enforcing the penalty clause in one instance and dropping the clause in another, the Citizens' Telephone Co., of Grand Rapids, Mich., is paying back penalties where demands have been made. Notices going out now are to the effect that on Oct. 1 all Citizens' Telephone Co. bills will be marked with the penalty clause.

District Court in Kansas Refuses to Restrain Mutual.

Judge J. E. Sharp of the district court at Columbus, Kan., has refused to give the Baxter Springs Telephone Co. an injunction restraining the Cherokee County Mutual Telephone Co. from installing and operating telephone service in Baxter Springs.

He held that the Mutual company was already established in Baxter Springs and was merely planning to extend its service there and so was not violating the ruling of the Utilities Commission that one telephone company can not invade a field where another is giving adequate service.

Monthly Payment Plan in Saginaw, Mich.

The Michigan State Telephone Co., Saginaw office, has inaugurated a system of monthly, instead of quarterly, payments for telephone service. The bills will be rendered on the first of the month and must be paid by the 15th.

Railway Telephony—Practical Points in All Branches

A Regular Department Which Appears Semi-Monthly—Scope Includes Principles of Construction, Testing, Operation and Maintenance—Columns Open for Contributions on Matters of General Interest to Those Engaged in This Branch of Telephony

Use of Iron Wire in Railway Telephone Service.

By John A. Kick.

The installation of metallic telephone train dispatching and message circuits is releasing a number of iron wires of the usual standard No. 8 gage, and the question is now arising: "What shall be done with these iron wires?"

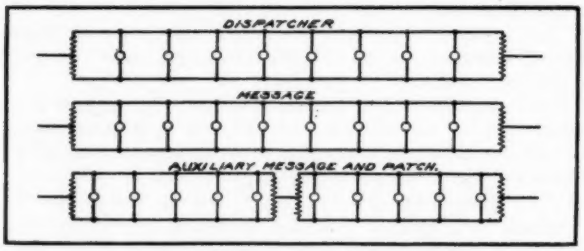


Fig. 1. Uses of Iron Wire Circuits.

Most railway divisions have two or more iron telegraph circuits which can be released when copper telephone dispatching and message circuits are installed. Some roads have seriously considered the removal of the iron wires while others are using them for patching facilities, blocking and auxiliary circuits and various other uses, for short haul service. The very best use for these iron wires is for patching primarily and as a secondary message circuit when not in use for patching.

It is important to any division that ample patching facilities be at hand in case of failure of regular pairs. It does not seem a good investment to furnish a copper telephone circuit for patching purposes only, while the two iron wires serve the purposes well, in view of the fact that they are only used in small sections and present no transmission difficulties.

It has been found that the transmission limit on a pair of No. 8 gage iron wires in average condition is about 100 miles. While pairs of wires of this gage and character, in first class condition, have been used over longer distances, the exceptions are rare.

On distances up to 100 miles, an iron pair can be used as an overflow message circuit to some of the more important stations. It will serve as a means of carrying the overload for the regular message circuit, and also in furnishing patching facilities in various sections when required.

On divisions considerably over 100 miles in length the iron pair can be very frequently used to advantage from both terminals to some intermediate point, and locally by both terminals between the terminals and the intermediate point. This is particularly true on trunk lines where both terminals handle way station telegrams, as the short iron circuit provides an auxiliary message circuit from each terminal to some intermediate point, thus taking the short-haul business from the first way message circuit. Fig. 1 shows diagramatically such a scheme and indicates that the simplex possibilities on the iron circuit can be used from terminal to terminal.

Before placing the circuit in such service, it should be transposed according to its pin position in the regular transposition scheme, all joints being bonded, soldered and placed in good condition, as this will be found necessary to secure a balanced and quiet line.

It does not seem that there will be a condition arise where one will be justified in entirely removing the old iron wires from the poles, unless they are in an exceptionally poor physical condition and causing trouble by frequent breaks. Some good use, at a very low investment cost, can be found for these wires in telephone service in reserving them for patching facilities.

Iron wire then has been in service some time, has little or no junk value, so that removal from the line means it will be a total loss while on the other hand it might serve, if undisturbed, for a number of years.

On some divisions the copper and iron circuits have cross connected at about the middle of the division bringing the transmission of both to an acceptable basis. The good results thus obtained have been deemed sufficient to warrant such an assignment as regular. Two parallel circuits, one of 210-lb. copper and the other of No. 8 gage iron wire in only fair condition, were cross connected at the middle of a 110-mile division. The result was two very good circuits.

It is evident that an iron circuit may present some additional difficulties from the standpoint of inductive disturbances, but instances are rarely encountered where special treatment will not give satisfactory results.

Some railroads have used extensively old No. 8 iron wire for metallic and grounded blocking circuits averaging about 6 miles in length and the results have been excellent. Where these lines are metallic, simplex circuits are arranged on each section and may serve as a way telegraph circuit or a through circuit between the terminals.

Two iron wires can be made into a station to station telephone circuit, and trainmen, trackmen and others instructed to use this circuit to call the nearest station. When necessary the circuit can be cut through to the dispatcher by means of repeating coils and switches at the stations. Such an arrangement would prevent overloading the dispatcher's circuit with booth and portable telephones which might prove defective and cause interruptions by reason of injury by lightning or other causes.

Pony telegraph circuits have been converted to telephone

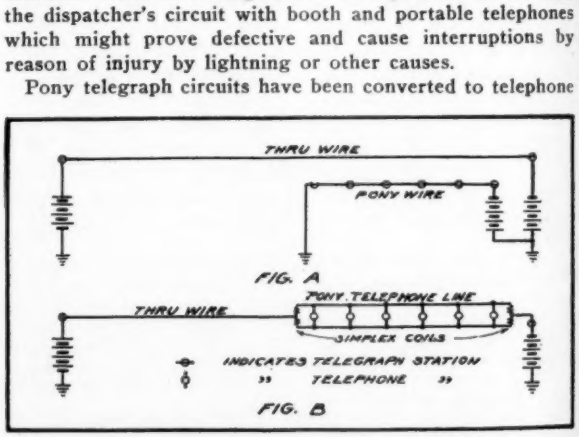


Fig. 2. Use of Wires for Telegraph and Telephone.

circuits by pairing the pony wire with a through telegraph wire over the yard territory, and then simplexing the pair to continue the through telegraph circuit. Fig. 2-A indicates the through and pony telegraph circuit in their original assignment and Fig. 2-B the same wires in local telephone and through telegraph service. This same arrangement can apply on both terminals and will often solve a

problem of securing better service over the railroad yard territories.

Where grounded blocking lines are maintained, certain sections may be found to be very noisy, due to induction from adjacent power or series arc circuits, and in such sections the grounded block circuit may be paired with a

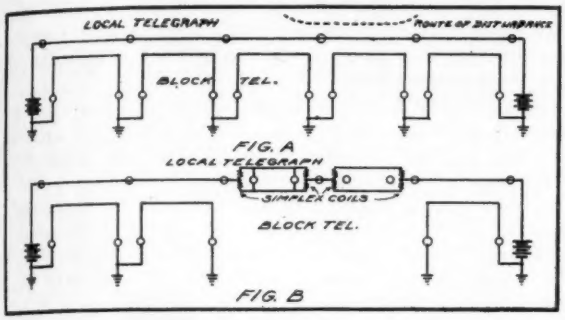


Fig. 3. Pairing of Grounded Block Circuit with Local Circuit.

local telegraph circuit. The block circuit can then be balanced and made quiet and at the same time the pair simplexed, as indicated in Fig. 3, for continuing the telegraph circuit.

The block circuit can thus be made metallic over an entire division with local telegraph circuit over the same wires. But the simplex coil used must have the proper characteristics for such service, else the telegraph circuit will be sluggish due to the reactance of the large number of coils.

Two such wires can be paired and coils of the right values will keep the resistance of the line down to or below that of one wire, as the coils can be very low wound. The transmission losses are not serious as the block sections are comparatively short and the telephones not more than two or three in number, so that the transmission margins are very high.

A copper pair gives too excellent service to use it as a means of making good, failures on all other pairs and having to continuously interrupt the established service on that pair. A pair of discarded iron wires represent a small investment in transposing and bonding and, when used in short patching sections, give such service that ordinarily the presence of the patch cannot be detected by the users of the service.

Phantom circuits will be broken up by failure of one of the physical pairs and the patch, whether copper or iron, will not restore the phantom to normal on account of the patching circuit not being phantom transposed with the good physical circuit. However a copper pair would no doubt be somewhat less noisy over the disarranged section if restoration of the phantom circuit be attempted during the time the physicals were irregular.

On heavy or long divisions, the dispatcher's and the message circuits should be of copper, but on short or light divisions two No. 8 gage iron wires, in fairly good condition, will prove an acceptable circuit and in all cases good use can be found for these iron wires. The pair of old iron wires will be found useful in some form and, if they are at all serviceable and physically secure, it can be safely said a ready means of conversation to a good purpose will be found for them.

Queries on Theory and Practice

Ringing of Telephone Bells by Induced Current.

We are operating a grounded magneto system in a town where there is an alternating current lighting plant carrying 2,300 volts. The other night all the lights went out and all the telephone bells in town rang. There was no particular line affected. We have three metallic lines and they did not ring. Our lines and the lines of the lighting company run parallel about 40 to 50 feet apart for a distance of from one-quarter to half a mile.

My opinion is that the lines of the lighting company became grounded and induced enough current on our lines to ring our telephones. Normally, there is no ground on the lines of the lighting company. The telephones rang for not longer than a second and then we had no more trouble.

Since the lines of the electric light company parallel your wires and carry fairly high voltage, you might easily get your bells rung from the induced current, when the power line became grounded. Doubtless the ground which came on to the power line accidentally, blew the fuses or threw out the circuit breakers in the power house, so that the ringing of your bells was only momentary.

A Grounded System and Alternating Current.

We are now operating our exchange on what is called the grounded system, and the local electric lighting company is operating a direct current system, but is thinking of changing to 2,300 volts alternating current soon. As it is now, we both use the same poles in some places.

We have about 73 telephones and 15 farm lines, all grounded. What will happen when the lighting company makes the change? Will we have to change all our lines to full metallic or not, or can we keep our lines grounded as they are now? The lighting company will have the current on 24 hours per day.

Please give us full details on this matter as this is the first time we have had to face anything of this nature.

If the electric light company has its wires on the same poles with your ground return lines and it intends to use 2,300 volts alternating current, you will certainly have noise. If the electric light wires parallel your telephone line a span or so, and are not closer than six feet, you may get along all right; but if the exposure is much greater, you will need to change to metallic. If a line, exposed to noise, comes into the telephone office through cable so that it is close to other telephone lines, it will carry noise onto them. A metallic circuit which itself is quiet, will carry induction onto other (grounded) lines.

We advise you to plan at once on changing all your lines to separate poles so as to get as far away as possible, from the electric light wires, then when the electric company begins using alternating current, you can change quickly if it bothers any of your lines.

Nearly all of your subscribers will notice the humming as soon as the alternating current is turned on. A few may complain for a while, until they get used to it. A moderate hum is not at all objectionable and by maintaining your dry cells in good condition, persons can talk without any discomfort. But in those cases in which the hum is too loud, you will have to place your wires further form electric light wire.

Voltage of Talking Currents on the Line.

What voltage is induced on a telephone line by ordinary conversation?

The voltage which a telephone produces varies between such wide limits that no average can safely be given. A telephone receiver, when used as a transmitter, may generate something like 0.01 volt. A local battery telephone in good condition may generate in the secondary of its induction coil not far from one to five volts, depending upon the ratio between the windings of the coil.

From Factory and Salesroom

Comparative Tests of Bell and Automanual Toll Circuits.

A series of telephone transmission tests in order to determine the comparative efficiency of transmission of a standard Bell and an Automanual toll circuit were recently made by McMeen and Miller, engineers, Chicago. The results of the test are of great interest to the Independent telephone field as indicating the superiority of equipment of Independent manufacture.

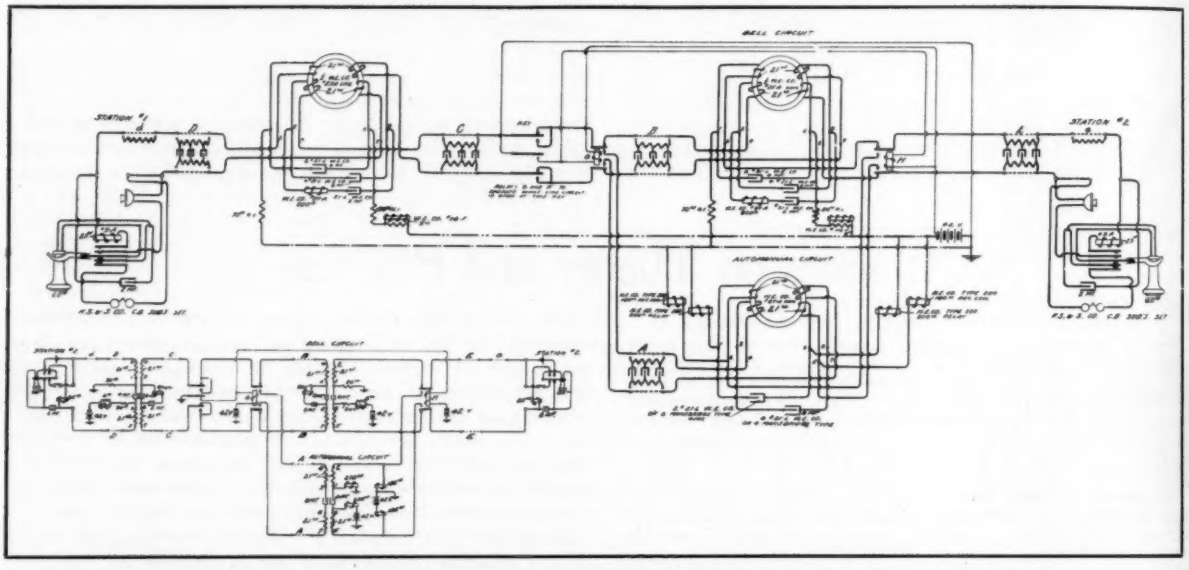
The Bell (A. T. & T. Co.) circuit used was that shown in a drawing No. SAR-338, dated March 21, 1913, except that the apparatus representing the cord circuit bridges was omitted and the non-inductive resistances used in the battery supply side of the circuit were reduced from 40 ohms to 30 ohms, as the voltage of the battery used in the tests was 42 instead of 48 volts. The Automanual circuit is a standard circuit of that system.

The circuits, as set up for testing, are shown in the accompanying illustration. The apparatus used in the circuits was standard Western Electric apparatus, except the Bell or Automanual circuit, in order to produce the same loudness of speech transmission in the two circuits.

The artificial cable used in these tests was a subdivided 60-mile artificial cable, with 88 ohms resistance, and .054 microfarad mutual capacity per mile. This cable was manufactured by The Leeds & Northrup Co., in accordance with the specifications of the A. T. & T. Co.

One series of tests was made in which Station No. 2 was used as the sending station and Station No. 1 as the receiving station. Another series of tests was made by using Station No. 1 as the sending station and Station No. 2 as the receiving station. In both the series of tests, the resistance of the sending loop and the length of the trunk (in standard cable) were varied to make the results applicable to practical conditions in which these factors vary between rather wide limits.

From the first series of tests, in which Station No. 2 was used as the sending station and Station No. 1 as the receiving station, it was found that by employing resist-



Wiring of Apparatus for Comparison Tests of Transmission Between Bell and Automanual Toll Circuits.

subscriber's station equipment and retardation coils and relays used in the Automanual circuit. The subscriber's station equipment, shown in the circuit drawing and designated as Station No. 1 and Station No. 2, is the standard common battery subscriber's station equipment manufactured by the Kellogg Switchboard & Supply Co. The retardation coils and relays used in the Automanual circuit are the same as those employed in the standard circuits of that system. The Mansbridge type of condenser was also used in the Automanual circuit in some of the tests in place of the Western Electric type.

In order that the tests might cover a variety of subscriber's loops and trunk lengths, arrangements were made for inserting an adjustable amount of artificial cable at the points designated as *C, D, E*. Arrangements were also made for inserting an adjustable amount of non-inductive resistance in the loops of Stations Nos. 1 and 2 at *d* and *e*, respectively. The adjustable, artificial cable shown at *A* and *B* was provided for the purpose of determining the miles of standard cable necessary to insert in either the ances at *e* in the sending loop of 100 ohms, 150 ohms and 180 ohms, and with 0 miles and 10 miles of standard cable inserted at *C* in the trunk line, there was no distinguishable difference of loudness of transmission between the Bell circuit and the Automanual circuit. With 205 ohms resistance inserted at *e* in the sending loop of Station No. 2, and with 0 miles, 10 miles, 15 miles, and 25 miles of standard cable inserted at *C* in the trunk line, it was necessary to place one mile of standard cable at *B* to obtain the same loudness of transmission with the two circuits. With 518 ohms resistance inserted in the sending loop at *e*, and with 0 miles and 10 miles of standard cable inserted at *C* in the trunk line, it was necessary to place two miles of standard cable at *B* to obtain the same loudness of transmission with the two circuits. With 1,050 ohms resistance inserted in the sending loop at *e* and with 0 miles of standard cable inserted at *C* in the trunk line, it was necessary to place two to three miles of standard cable at *B* to obtain the same loudness of transmission with the two circuits.

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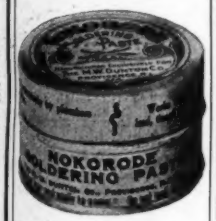

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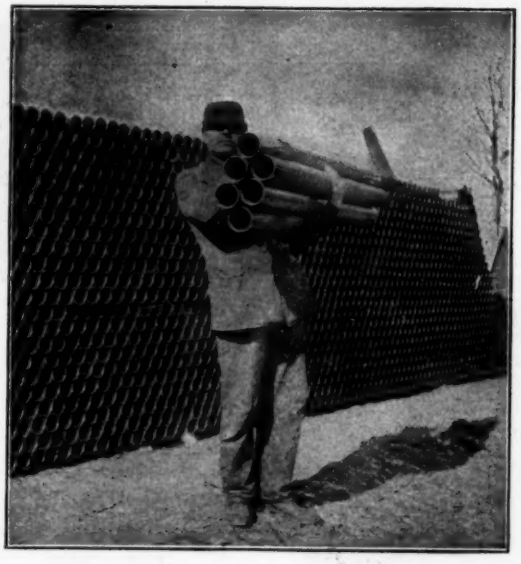

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In the second series of tests, in which Station No. 1 was used as the sending station and Station No. 2 as the receiving station, it was found that by employing 100 ohms resistance in the sending loop at *d* and 0 miles and 10 miles of standard cable in the trunk line at *C*, it was necessary to insert two miles of standard cable at *A* to obtain the same loudness of transmission with the two circuits. With 518 ohms resistance inserted in the sending loop of Station No. 1 at *d* and 10 miles of standards cable inserted in the trunk line at *C*, it was found necessary to place two miles of standard cable at *A* to obtain the same loudness of transmission with the two circuits. With 1,050 ohms resistance inserted in the sending loop of Station No. 1 at *d* and 0 miles of standard cable inserted in the trunk line at *C* it was found necessary to place two miles of standard cable at *A* to obtain the same loudness of transmission with the two circuits.

To eliminate any difference in loudness of transmission, which might be due to a difference in the repeating coils and condensers employed in that portion of the Bell circuit that was compared with the Automanual circuit, check tests were made by reversing the positions of these coils and condensers with respect to the circuit in which they were connected. That is, the No. 27-A repeating coil and associated condensers, shown in the drawing of the Automanual circuit, were placed in the Bell circuit, and the ½ No. 25-A repeating coil and associated condensers, shown in the Bell circuit, were placed in the Automanual circuit.

The character or timbre of the received transmission throughout the entire tests, was practically the same for the Automanual as for the Bell circuit.

Throughout the tests just described, a receiving loop of zero ohms resistance was employed. Several check measurements were made by placing resistance in the receiving loop and it was found that for the same sending loop resistance, the results, as given above, checked.

Tests were also made, using the Mansbridge type condensers in place of the Western Electric in the Automanual circuit, and the results for the same sending loop resistance checked with those given above, thus indicating that the transmission efficiency of the Automanual circuit is as good when using the Mansbridge type of condenser as when using the Western Electric type.

To present the results of the tests in a form capable of ready comparison, a summary of the tests as enumerated above is as follows:

Sending Station.	Receiving Station.	Sending Loop Resistance.	Receiving Loop Resistance.	Trunk Length.	Comparative Efficiency of Transmission. Bell Louder.	Comparative Efficiency of Transmission. Automanual Louder.
No. 1	No. 2	100 ohms	0 ohms	0-10 Mi.		2 Mi.
No. 1	No. 2	205 ohms	0 ohms	0-10 Mi.		2 Mi.
No. 1	No. 2	518 ohms	0 ohms	0-10 Mi.		2 Mi.
No. 1	No. 2	1050 ohms	0 ohms	0 Mi.		2 Mi.
No. 2	No. 1	100 ohms	0 ohms	0-10 Mi.	Same for both	
No. 2	No. 1	150 ohms	0 ohms	0-10 Mi.	Same for both	
No. 2	No. 1	180 ohms	0 ohms	0-10 Mi.	Same for both	
No. 2	No. 1	205 ohms	0 ohms	0-25 Mi.	1 Mi.	
No. 2	No. 1	518 ohms	0 ohms	0-10 Mi.	2 Mi.	
No. 2	No. 1	1050 ohms	0 ohms	0 Mi.	2-3 Mi.	

The conclusions to be drawn from the transmission tests as described are summarized by McMeen and Miller as follows:

1. Using Station No. 1 as the sending station, the transmission, with different sending loop resistances and trunk lengths, is two miles of standard cable better with the Automanual circuit than with the Bell circuit.

2. Using Station No. 3 as the sending station, the loudness of transmission is the same for the Automanual as for the Bell circuit for sending subscribers' loops of resistances from 0 to 180 ohms, inclusive; the transmission is one mile of standard cable better with the Bell circuit than with the Automanual circuit for a sending subscriber's loop of 205 ohms resistance; the transmission is two miles of standard cable better with the Bell circuit than with the Automanual circuit for a sending subscriber's loop of 518 ohms resistance; and with a sending subscriber's loop of 1,050 ohms resistance, the transmission is two to three miles of standard cable better with the Bell circuit than with the Automanual circuit.

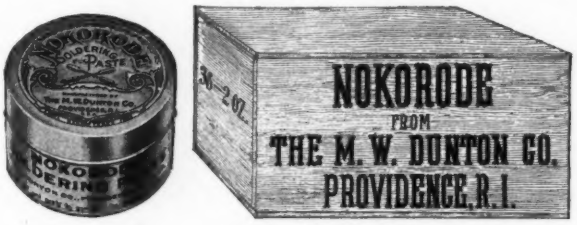
3. The differences in transmission equivalents, as noted under conclusions 1 and 2, are not of sufficient magnitude to have an appreciable influence, one way or the other, on commercial transmission, and could not be detected readily by the average telephone user.

4. The transmission efficiency of the Automanual circuit is as good with the Mansbridge type as with the Western Electric type of condensers.

5. The character or timbre of the received transmision is practically the same with the Automanual circuit as with the Bell circuit.

Nokorode Soldering Paste.

Nokorode soldering paste, the product of M. W. Dunton Co., Providence, R. I., has proved so effective for general soldering work and its use has solved so many peculiar



Sample 2-oz. Box. Standard Nokorode Shipping Case.

soldering problems that the wi lespread popularity of the soldering flux which is as "safe as rosin" and as "quick as acid," is readily explained. The fact that, as its name implies, it is non-corrosive, that it will solder all metals except aluminum, which does not need a flux so much as

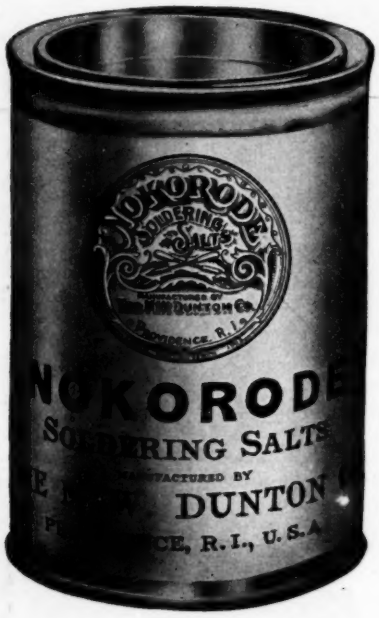
Nokorode Soldering Paste in 1-lb Can.

a low melting point solder, and that a small amount of paste will do a large amount of satisfactory work are its chief merits.

Another factor, however, which has entered largely into

its success is the pride which the company takes in maintaining the high standard of its original output. It is claimed that every box sent out is compounded by a graduate compounding chemist and that as much care is taken in putting it up as would be given by a druggist to a medical prescription; also, that the smallest portion that may be picked up on the head of a pin has all the elements of the flux. It is further declared that there is absolutely no difference between a sample box given out several years ago and a 50-lb. pail delivered today.

The soldering done with Nokorode has been subjected to some interesting tests that indicate the efficiency of the flux. For example, a brass ring was soldered to the bottom of an old galvanized iron tank used on a gas stove



Nokorode Soldering Salts in 1-lb. Can.

for years, without cleaning or preparing the surface in any way. When cold an attempt was made to separate the two by force, with the result that the galvanized surface was pulled from the iron without breaking the joint. On a greasy Norway iron armature a small place was filed smooth and bright and a piece of copper wire soldered thereto. When cool the copper wire broke under force, but the joint held good. An ordinary flat head wood screw with head not very new or bright, in fact somewhat rusty, was taken and by the use of Nokorode the entire head and slot was covered with solder.

A number of years ago the New England Telephone & Telegraph Co. of Boston experimented with Nokorode for six months and the results from these tests were so satisfactory that the company adopted Nokorode and has used it exclusively ever since. There are various companies which use Nokorode exclusively, including the D. & W. Fuse Co., the Johns-Pratt Co., The Sachs Co., and the Bryant Electric Co.

Many puzzling soldering difficulties have been overcome by various companies with Nokorode and M. W. Dunton Co. has performed a considerable service for its customers by collecting a large number of "soldering kinks" and publishing them as a part of its vigorous business-getting campaign. The company has been very energetic in devising new means of serving its customers. Agents are maintained in the important cities of the country and at various points abroad, and one of the plans adopted was the publication of advance inductory cards having a half-tone likeness of the company's local sales manager together with his name and address. These cards are sent out on receipt of inquiries and carry an announcement of the representative's expected call and adding: "Tell Mr. ——— your soldering troubles. Maybe he can suggest a way out."

"Nokorode Soldering Salts," another product of M. W. Dunton Co., is the name of a soldering flux in dry powder form to which water may be added as fast as desired, thus saving the cost of transportation on a heavy bulk of liquid, additional charges for containers, waste and other unnecessary expense. This substance is extensively used by the canning, hardware and milling supply trades and for bench work. It is put up in tin cans, and six 1-lb. cans are shipped in a standard package. The company states that it has just received its first consignment of friction top decorated tin cans which will hereafter be used for Nokorode Soldering Salts.

The company has recently added a number of new branch offices and sales representatives to its list, each of which carries a large stock of Nokorode constantly on hand from which orders are filled in order to insure quick deliveries, closer personal attention and a saving in transportation charges. The company's representatives are as follows:

R. W. Smith, 30 Congress street, Boston, Mass.; W. T. McDowell, 50 Church street, New York City; C. C. Davis, 12th and Filbert streets, Philadelphia, Pa.; Chas. F. Saenger, Electric Building, Cleveland, Ohio; R. L. Thayer, 424 S. Clinton street, Chicago, Ill.; A. G. Thompson, 247 Jos Campau avenue, Detroit, Mich.; Brown & Hall, 620 Central National Bank Building, St. Louis, Mo.; Riverside Electrical Co., 535 Riverside avenue, Jacksonville, Fla.; Fobes Supply Co., 560 First avenue, Seattle, Wash.; Fobes Supply Co., 343 Oak street, Portland, Ore.; Stewart-Fuller Co., 40 Stevenson street, San Francisco, Cal.; Montana Electric Co., Montana Electric Building, Butte, Mont.; Barden Electric & Machinery Co., Houston, Texas; Nunn Electric Co., Amarillo, Texas; J. A. McEachren, 335 Langside street, Winnipeg, Manitoba; Hinton Electric Co., Ltd., Victoria, B. C.; Los Fabricantes Unidos, Belgrano 964, Buenos Aires, Arg.; Carlos E. Jamarillo, Huerfanos 1164, Santiago, Chile.

The Delta Electric Co., of Indiana.

The Delta Electric Co., an Indiana corporation located at Marion, Ind., has taken over all the patents, tools, dies, machinery, stock of materials and good will of the Delta Electric Co., of Chicago. The new company will push the manufacture and sale of the lockout party line system which was formerly made by the Baird and Delta Electric companies of Chicago. The improved telephone pay stations, both prepayment and post-payment, and meters will also be developed. The new company expects to push other devices started by the Chicago concern, to do outside manufacturing, and to perfect and develop inventions pertaining to telephone and electrical apparatus.

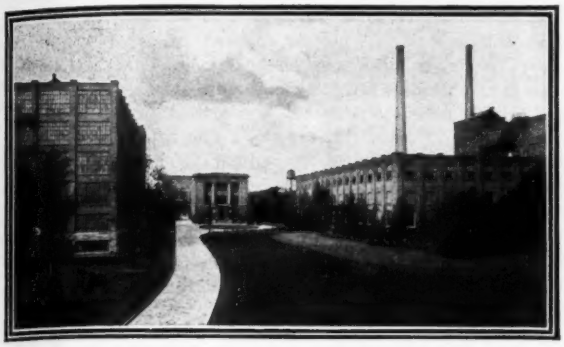
The company's plant in Marion is being fitted up with modern machinery and it is stated that production will be started in the course of a few days. The company is financially backed by ten of the most prominent business men in Marion in addition to those making up the former Chicago company. It is said that a very substantial and able concern has resulted.

The officers of the company are as follows: J. W. Stephenson, president; Arthur E. Case, vice-president and general manager; W. B. Stephenson, secretary and treasurer.

The engineering staff consists of Arthur E. Case, Jno. J. Brownigg, and Harry Henderson.

New Intercommunicating Equipment of Eastman Kodak Co.

Intercommunicating telephone service is now part of the equipment of every modern factory and when a plant covers



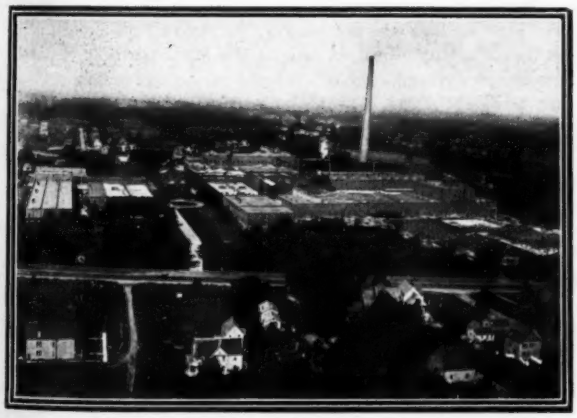
Entrance to Kodak Park Works.

several acres and comprises many separate factory buildings, intercommunicating telephone service becomes vitally important to the operation of the plant.

The Eastman Kodak Co., of Rochester, N. Y., has realized for some time that the non-multiple private branch exchange at its Kodak Park plant has been inadequate for the service demanded and accordingly is now installing a new Stromberg-Carlson four-position, lamp line, multiple switchboard, of 1,000 lines ultimate capacity.

The cabinets are of the single position type so designed that other sections may be readily added as required. The woodwork is quarter-sawed oak with a dull golden oak finish. This finish is standard with the Stromberg-Carlson Telephone jacks. A great many calls are trunked from this exchange as the Eastman Kodak Co. has another P. B. X. switchboard in Mfg. Co., and is particularly adapted to resist wear and not show scratches.

A cable turning section is located at the initial end of the switchboard and this section also carries one panel of multiple its State street offices, three miles away, and connections must be made between the Kodak Park P. B. X., the State street



View of Kodak Park Plant Taken from a Kite.

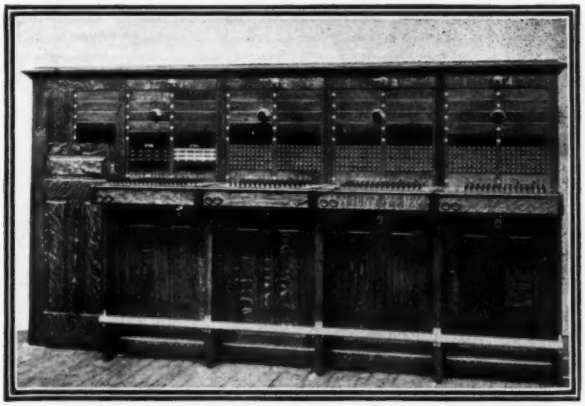
P. B. X. and the main exchange of the Rochester Telephone Co.

The first position of the switchboard is a trunking position and is equipped with 30 plug-ended trunks—15 assigned to State street and 15 to the Rochester main exchange. These trunks are provided with lamp line and lamp disconnect signals. All trunk connections are handled by the trunk operator who also has before her a complete multiple of all local lines and also four pairs of regular cord equipments. This arrangement is such that the trunk operator can find parties throughout the factory and have charge of the information work generally required on a P. B. X. board. Order wire circuits are provided on regular positions so that trunk connections may be ordered up as required, the trunk operator plugging up a trunk directly into the multiple jack.

The three regular operators' positions are each equipped with 120 lamp signal line equipments and 15 cord pair equipments. Line circuits are of the line and relay cut-off type, with full multiple, using the same apparatus as is used in large multiple switchboards. The cord circuits have double lamp supervision to aid in giving quick service. Each cord pair equipment has the usual ringing and listening key and ring-back key for ringing a called party. This feature is particularly desirable in P. B. X. boards. Suspended type transmitters and head band receivers are furnished on each position.

A complete multiple equipment is provided for every three panels. With this arrangement every operator can readily reach each multiple jack without interfering with the work of neighboring operators as every jack will be before her or in the adjacent panel.

The line relays are mounted separately from the switchboard



Stromberg-Carlson Board Furnished the Eastman Kodak Co.

on a combination relay rack and terminal frame where they are easily accessible for inspection and the frame is designed for growth to the ultimate capacity of the switchboard.

The equipment also contains a complete main distributing frame and protector equipment mounted separately from the switchboard and from the relay rack. The protector equipment is located approximately in the center of the plant to obtain economy in cabling the various buildings. The duplicate sets of storage batteries, charging equipment and ringing machine are also located in a separate room. The various pieces of equipment are connected by lead covered cable and every precaution is taken to avoid disabling the telephone system.

The new switchboard has an ultimate capacity of 1,080 lines with a present equipment of 360 lines and 30 trunks. The circuits and design are such as to give fastest possible service.

Johns-Manville Company's Galveston Office.

The spirit of business enterprise which characterizes this aggressive concern is once more evidenced by the opening of a new office and warehouse in Galveston, Texas. The H. W. Johns-Manville Co. now has three offices in the Lone Star state, at Houston, Dallas and Galveston. At the last named place, in a modern brick warehouse of large proportions, will be consolidated the stock for dis-

tribution to the different offices and throughout the firm's Texas territory.

Galveston, because of its location and shipping facilities, makes an ideal concentration center. The company plans to receive direct at this point, heavy shipments by coastwise lines from New York. The steadily increasing trade with Central and South America also makes Galveston a convenient point of distribution.

The H. W. Johns-Manville Co. is among the country's largest houses dealing in roofing, building materials, packings, pipe coverings, insulating materials and electrical goods, and is the world's largest manufacturer and distributor of asbestos goods. This concern owns extensive asbestos mines in Danville, P. Q., Canada, and has nine factories located in various cities throughout the United States.

New Sales Manager for American Carbon & Battery Co.

The American Carbon & Battery Co. announces that on October 1, D. E. Ford will join the organization as sales manager. Mr. Ford has been connected with the Wesco Supply Co. of St. Louis where for the past several years he has had the management of that company's telephone apparatus and specialty departments. Mr. Ford is well and favorably known in the electrical field.

The American Carbon & Battery Co. also announces that on account of increase in orders and the details in connection with the proper execution thereof, it is found necessary to consolidate the company's office at St. Louis with its factory at East St. Louis, Ill., and on and after October 1, the company's mailing address will be East St. Louis, Ill.

The Allen Soldering Flux Products.

L. B. Allen & Co., Inc., 4517-4529 N. Lincoln street, Chicago, makers of the Allen soldering paste, Allen soldering stick, Allen soldering salts, and Allen soldering liquid with fountain brush, has received an interesting endorsement of these products from the Northwestern Electric Equipment Co., St. Paul, Minn. This company published free of charge in its house organ, The Northwestern Buzzer, a page devoted to a description of the Allen soldering products and by special arrangement with Allen & Co. mailed a trial can of Allen soldering paste to every reader with the request that it be tried out "on the job."

In closing its announcement the Northwestern Electric Equipment Co. said: "The Allen flux line is one of the best known on the market today and we recommend it to our trade for all and any kind of use when a high grade soldering flux is desired. We have tested it thoroughly and have approved it ourselves before recommending it to you. Will you let us know what you think of it? Use the coupon below."

Recent Installations.

The Monarch Telephone Mfg. Co., of Fort Dodge, Iowa, reports considerable activity in switchboard business. A 500-line board of the magneto type, was recently shipped to the Fairfax Telephone Co., Fairfax, Mo., and another 500-line board of similar specifications is being made for the Moody County Telephone Co., Flandreau, S. D.

Three private branch exchange switchboards were shipped a short time ago to one company in Canada, while other Canadian customers have taken three more in the past few weeks. Smaller magneto boards have been furnished Cummings, Kans., Red Oak, Okla., Sheldahl, Iowa, Nevada, Tex., and Louisville, Neb. One of the popular Monarch two-position desk type boards has just gone forward to the Granby & Neosho Telephone Co., Granby, Mo.

Stromberg-Carlson Company's New Booklet.

The new booklet of the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., devoted to private telephone systems for offices, stores, factories and residences contains convincing illustrations and descriptive matter concerning the various types of apparatus used in connection with the company's Inter-Comm-Phone system. This booklet, which is entitled "Systems That Save Business Time," is used in connection with the new advertising and sales plan for the sale of the Inter-Comm-Phone system by local telephone companies on a commission basis, as described in last week's issue of TELEPHONY under the head "Going After the Private Telephone Business."

Under the arrangement described, the intercommunicating system is sold and installed by the local telephone company, the statement that it is installed by the Stromberg-Carlson Co. being incorrect. As stated, the company is doing extensive national advertising in connection with this plan, which should make sales easy in many instances.

Paragraphs.

R. S. MUELLER, manufacturer's agent and warehouseman, 423-425 High avenue, S. E., Cleveland, Ohio, has issued the Cleveland stock sheet, showing magnet wire in Cleveland stock on September 19, 1913.

STROMBERG-CARLSON TELEPHONE MFG. CO., Rochester, N. Y., has issued a number of attractive leaflets devoted respectively to a description and illustration of the company's office wall telephone, combination telephone, oak hotel telephone, desk telephone, wood residence telephone and magneto switchboard. The last page of these leaflets is devoted to a blank form which can be used to request further information regarding the type of equipment described.

Postal Telegraph Files Complaint in Maryland.

J. A. Vogt, Baltimore manager of the Postal Telegraph Cable Co., has made a complaint to the Public Service Commission of Maryland that the company's telephone service has been tampered with in order to divert the Postal's business to the Western Union Telegraph Co. The complaint says that on August 15 the First National Bank tried for 10 minutes to obtain the Postal office and the person calling was repeatedly told the Postal line was busy. On August 27 last the Merchants & Miners' Transportation Co., it is alleged, tried unsuccessfully for 15 minutes to reach the Postal office. Manager Vogt says he is prepared to prove that the line was not busy at the time of either call and that the company's first excuse to the Merchants & Miners' company that the Postal office force was slow in answering is also false.

Telephones on North Dakota Reservation.

The Fort Berthold reservation will soon have a telephone line. E. B. Baker, who is interested in a store at Parshall, N. D., several miles north of the line and west of Plaza, N. D., is to be in charge of the work. Mr. Baker has the distinction, it is said, of having put through the first telephone line in the United States—in Connecticut. When the Bell company bought out his holdings, he entered its employ and was sent west to superintend the building of new lines.

Grand Rapids Complaints Referred to Commission.

The city council of Grand Rapids, Mich., has voted to refer all complaints from individuals respecting telephone service, to the Michigan Railroad Commission and the city attorney has been instructed to present the cases for individuals who have made complaints and to use all due efforts to make out a case if the occasion demands that more evidence be submitted.

Legal Cases and Decisions

By A. H. McMillan

Is Mail Box on Pole a Trespass?

When the cable and cable box of a telephone company were removed from its pole, the ground wire was left to swing, idly and uselessly, from the pole in close proximity to, and likely to come in contact with, the high power feed wire of an electric light company. The ground wire was allowed to remain in contact with the feed wires and also in contact with the galvanized iron R. F. D. mail box attached to the telephone pole, so that the box itself became charged with electric current from the feed wires. The owner of the mail box went to get her mail from it, and, when she laid her hand upon it to open it, received a powerful current of electricity through her hand, arm and body, sustaining various injuries.

Suit was brought against the telephone company to recover for these injuries. It was the company's defense that the mail box was placed on the pole without its knowlege and consent, and that therefore the placing of it was an act of trespass, and for this reason the company owed only the duty of not wantonly and willfully injuring the owner. The court held, as it did not conclusively appear either one way or the other that the mail box was on the company's pole without its consent, but might have been on another pole in the neighborhood, the jury was justified in returning verdict for the plaintiff.

It appeared that the contact of the telephone wire with the highly charged electric wire, was due to the breaking off of a telephone pole by a steam roller which knocked down one of the guy posts of the company. The company insisted that it had had no notice, either actual or constructive, of the dangerous condition of its wire. This question was also held to be one for the determination of the jury. Atlanta Telephone & Telegraph Co. vs. Cheshire, 78 Southeastern, 53.

Injury on Premises Where Pay Station Is Located.

A passerby observed the usual "Blue Bell" sign in a window occupied as a shoe store. She went in to telephone and was directed by the proprietor to the telephone. After using it, and while passing toward the cashier's desk to pay the charges, she stepped into a hole in the floor caused by one of the proprietor's employes lifting a trap door to the basement, which had been constructed two years after the telephone was installed.

The trap door had been lifted after she had commenced using the telephone. The proprietor gave testimony to show a remark was made in the presence of the passerby that the trap was about to be opened. After using the telephone, the woman stepped into the trap door and was injured. She sued the telephone company and the shoe store proprietor for the injury.

The telephone was installed pursuant to a request in writing made by the proprietor of the shoe store in which he was designated as "the subscriber," and the telephone was called "a public telephone pay station." He agreed to pay the company 80 per cent. of all tolls charged by it for messages from this station. It was agreed that all signs, booths and other equipment furnished by the company should remain its property.

The court held that from these provisions the proprietor of the shoe store had a direct interest in the use of the telephone and possession thereof as bailee. It was therefore his duty, in inviting and permitting patrons to use the telephone, to exercise reasonable care to maintain his premises in a reasonably safe condition.

As to the telephone company, it was held there was no basis for recovery. It was not in possession of the premises and although it shared with him in the profits arising from the use of the telephone, it was in no manner interested in the use of the trap door, which was in his exclusive possession. The trap door was not opened in connection with the use of the telephone. Therefore the judgment against the telephone company was reversed. Sullivan vs. New York Telephone Co., 142 New York State, 735.

Long Distance Lines Included.

Under the laws of Texas (Rev. Civ. St. 1911, Arts. 1231, 1235) providing that telegraph corporations may set their poles and wires along and across any of the public roads and streets of the state in such a manner as not to incommode the public use thereof and that the corporate assets of any city, town, or village, through which the line of any telegraph corporation is to pass, may, by ordinance, specify where the poles shall be located, and, after the erection may direct alterations, it is held that the right of a long distance telephone company to pass through a city or town over and upon its streets, is absolute, although the city may enforce reasonable regulations. Further, a city cannot require a long distance company to adopt its ordinances as a condition precedent to the using of the streets granted by section 1231, for it is the right and duty of the city to enforce its ordinances, prescribing reasonable regulations, whether acceptable to the company or not.

The right of regulation is waived by the city refusing to prescribe the streets to be used and the details of construction. In the same connection it is held that the city cannot refuse a permit to erect poles on the ground that it deposited a certified check instead of money, and adopted only the civil ordinances of the town, for the check was equal to cash and the acceptance of civil ordinances embraced all that were regulatory.

The court held, however, that its decision should not give the company the right to transact local business, without the consent of the city. City of Brownwood vs. Brown Telegraph & Telephone Co., 157 Southwestern, 1163.

A Dissolved Company.

A telephone and telegraph corporation, which did no business and was apparently organized for the purpose of issuing securities as a subsidiary or auxiliary of a company proposing to build a projected telegraph line, will be enjoined from using a dissolved corporation's name, which was not descriptive of its business, and which apparently was adopted for the purpose of misleading investors to believe that its bonds were those of the original company, which had a high market value. This will be done not only to protect the dissolved corporation, its bondholders and its successors in business, but to prevent a fraud on the public, even though it was not competing in business with the dissolved corporation or its successor.

This ruling was made by the Supreme Court of New York in an action brought by the Metropolitan Telephone & Telegraph Co. against another corporation of the same name. The complaining corporation had transferred all its property and franchises. except the franchise allowing it to be a corporation, to another company, and had voluntarily dissolved, but had bonds outstanding on which it is still liable. Therefore, under the express provisions of the general corporation law, it was considered still in existence for the purpose of paying its debts, and had a sufficient interest in its corporate name to maintain the suit in question. Metropolitan Telephone & Telegraph Co. vs. Metropolitan Telephone & Telegraph Co., 141 N. Y. S., 598.

Record of Telephone Patents Recently Issued

1,070,663. August 19, 1913. GUY ANCHOR; Fred N. Bierce, Cincinnati, Ohio; assigned to the Specialty Device Co. Comprises a member adapted to be inserted in a suitable hole and having a grooved upwardly tapering portion, the upper surface of the grooves tending in a downward and outward direction.

1,070,726. August 19, 1913. HARMONIC SELECTIVE TELEPHONE SYSTEM; Arthur F. Poole, Wheeling, W. Va. The features of this invention are: sources of current of different character at the central exchange, signal bells, and circuit-controlling devices. Certain bells are responsive to certain current, the other bells remaining unactuated.

1,071,207. August 26, 1913. TELEPHONE SYSTEM; Elmer R. Corwin and Chas. A. Bals, Chicago; assigned to the Corwin Telephone Mfg. Co. Describes a relay system with provision for automatically connecting the periodic ringing current to the called line. It also relates to the operator's control mechanism.

1,071,208. August 26, 1913. TELEPHONE SYSTEM; Elmer R. Corwin, Chicago; assigned to the Corwin Telephone Mfg. Co. Relates to multiple switchboard equipment in which the operator's set is automatically cut out by relays after the called subscriber answers.

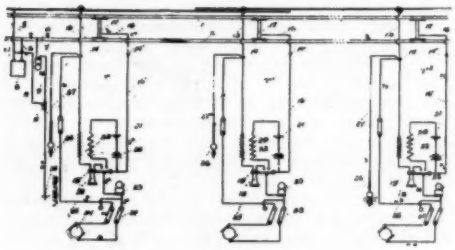
1,071,209. August 26, 1913. TELEPHONE EXCHANGE SYSTEM;

Elmer R. Corwin, Chicago; assigned to the Corwin Telephone Mfg. Co. In this invention a description is given of means for the interconnection of the line and the supervisory and clearing out signals. Provision is made for enabling the user to stop the signal.

1,071,210. August 26, 1913. TELEPHONY; Elmer R. Corwin, Chicago; assigned to the Corwin Telephone Mfg. Co. The feature of this patent is a test controlling means at the stations of an intercommunicating system so that the attendant at one station may ascertain the conditions of trunk lines.

1,071,211. August 26, 1913. TELEPHONY; Elmer R. Corwin, Chicago; assigned to the Corwin Telephone Mfg. Co. Relates to connection with a semi-automatic exchange, selecting mechanism being provided at the exchange for automatically connecting stations with trunk lines.

1,071,212. August 26, 1913. TELEPHONY; Elmer R. Corwin, Chicago; assigned to the Corwin Telephone Mfg. Co. Describes an intercommunicating telephone system which includes three or more telephone lines and a busy test circuit. Apparatus at the station serves partially to establish the busy test circuit, being common to all lines. Means are provided for completing the busy test in co-operation with the apparatus at the station of the line seeking connection with the line taken for use.



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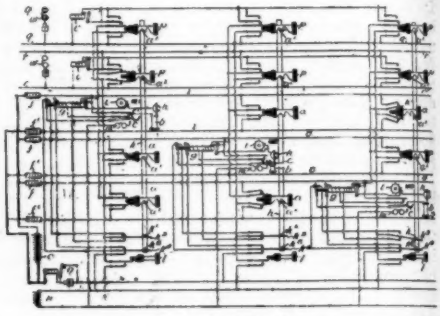


No. 1,071,212.

1,071,279. August 26, 1913. PROTECTIVE DEVICE FOR ELECTRICAL CIRCUITS; H. R. Van Deventer, Sumter, S. C. Relates to a lightning arrester formed from flat material bent into zigzag shape. The parts are interchangeable.

1,071,292. August 26, 1913. LOCKOUT TELEPHONES FOR PARTY LINES; Elhanan Bowman, Elmwood, Ontario, Can.; assigned one-half to C. R. Miller. The principal feature of this lockout system is a lockout relay magnet, means being provided for the automatic depolarization of the armature.

1,071,588. August 26, 1913. SYSTEM OF SELECTIVE CONTROL; C. E. Scribner, Jericho, Vt., James L. McQuarrie, Montclair, N. J., and Edward B. Craft, Hackensack, N. J.; assigned to the Western Electric Co. The system is adapted for a plurality of stations such as used for train dispatching. A selector at each station is responsive to positive or to negative impulses.

1,071,601. August 26, 1913. SUBSTATION TELEPHONE SET; William O. Beck, Ridgefield, N. J.; assigned to the Western Electric Co. Relates to a wall set having a metal backboard and a metal shelf.

1,071,652. August 26, 1913. SIGNALING SYSTEM FOR PARTY LINES; Richard F. Spamer, New York; assigned to the Western Electric Co, Describes a relay controlled selective signaling system for way stations as used in railroad telephone dispatching.

1,072,400. September 2, 1913. AUTOMATIC BATTERY CUTOUT FOR TELEPHONE CIRCUITS; Anton R. Nelson, Janesville, Cal. This device is intended for party line use in the substation sets. A stop element carried by the switch hook co-operates with another element under control of the ringing generator. The transmitter circuit is not closed until the generator has been operated, but the receiver circuit is rendered operative by the action of the switch hook.

1,072,459. September 9, 1913. SUBSTATION SELECTIVE APPARATUS; Oscar B. Hjorth, Sandwich, Ill. Relates to a relay controlled system of signaling through a step-by-step selector. All time elements are dispensed with and the system may be operated by ordinary keys and switches, should the central station mechanism become inoperative.

1,072,513. September 9, 1913. ATTACHMENT FOR TELEPHONE TRANSMITTERS; Edmund M. Schollenberger, Chicago; assigned one-half to Lee A. Stahl. Describes a nearly closed chamber having an aperture which closely fits the mouth. The chamber is placed over the transmitter mouthpiece to confine the sound.

1,072,537. September 9, 1913. INDIVIDUAL TELEPHONE MOUTHPIECE; Clarence S. Warren, Milford, Ohio. Describes a band adapted to encircle the telephone transmitter and carrying a series of individual mouthpieces, each being pivotally connected to the band so that any mouthpiece may be applied or removed from the regular mouthpiece of the instrument.

1,073,018. September 9, 1913. SIGNALING AND TELEPHONE SYSTEM FOR RAILROADS; Warder J. Bailey, Cedarville, W. Va. Provides for communication with moving trains and uses the track rails and a conductor alongside the track.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

A. S. HEDGE, manager for the Iowa Telephone Co., in Bloomfield and Moulton, Iowa, has resigned to engage in the mercantile business.

J. F. BROWN, of Madison, Wis., has been appointed manager of the Waupun, Wis., office of the Wisconsin Telephone Co., succeeding Lee Dexter.

ROY NORRIS, of Eureka, Ill., has been appointed manager of the Central Union Telephone Company's office at Pekin, Ill., succeeding H. D. Bonham, resigned.

JAMES B. MILLER, district manager of the Missouri & Kansas Telephone Co., at Winfield, Kans., has resigned to accept a position in a bank at Cedarvale.

OWEN L. GRUNDY has resigned his position as manager of the King City Telephone Co., King City, Mo. Mr. Grundy expects to take up a homestead in Montana.

J. A. MADDEN, head of the contract department of the Iowa Telephone Co., has been appointed local manager of the Council Bluffs office of the company, to succeed Frank Elgan.

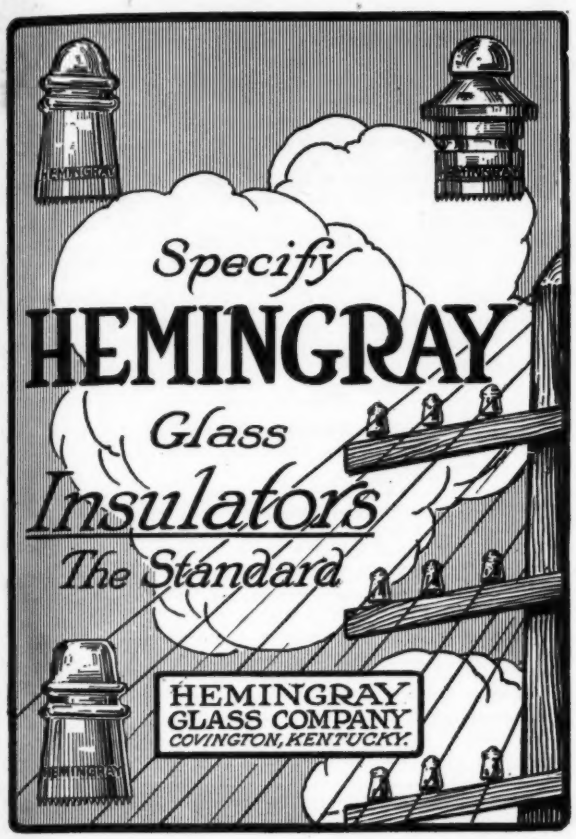
F. J. MAYER, for eight years manager of the Madison district of the Wisconsin Telephone Co., will leave October 1 for Milwaukee, where he will take charge of the plant department.

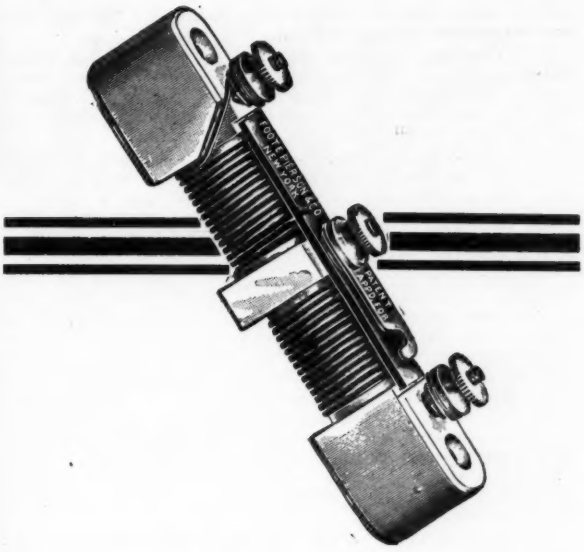
JAY A. RONEY, manager of the Luverne Telephone Co., Luverne, Minn., has resigned and will remove to Sioux Falls, S. D. Chas. Dodge, of Minneapolis, has been appointed to succeed him.

K. W. SHELTON has been appointed local manager of the Earlington, Ky., exchange of the Cumberland Telephone & Telegraph Co., to succeed J. K. Tucker, who has been transferred to Providence, Ky.

ROBERT BOYD, formerly in the commercial department of the Wisconsin Telephone Co., at Beloit, Wis., has been promoted to chief commercial man of the Janesville division, which includes 23 towns in that vicinity.

A. JUDSON SMITH, superintendent of the Consolidated Telephone Co., of Carbondale, Pa., has resigned on account of poor health. Mr. Smith has been connected with the company





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Literature on Request.

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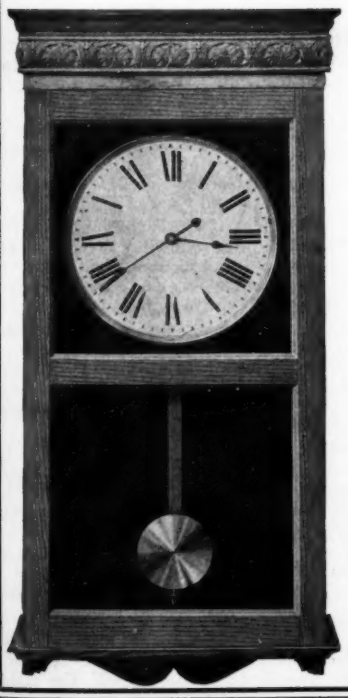

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for 12 years. He is succeeded by James W. Stewart, who was transferred from Pittston.

C. L. MILLER, formerly manager of the Kenosha Home Telephone Co., at Kenosha, Wis., and for the past year manager of the Janesville division of the Wisconsin Telephone Co., has been appointed manager of the Madison district of the company, to succeed F. J. Mayer.

K. FR. WINCRANTZ, general manager of the Stockholm Telephone Co., Stockholm, Sweden, which operates in competition with the government telephone system, was a caller at TELEPHONY's offices a few days ago. He has spent seven weeks in the United States examining the different telephone systems in this country and has gained many valuable ideas.

FRANK ELGAN, for the past four years manager of the Iowa Telephone Company's exchange at Council Bluffs, Iowa, has recently been promoted to the position of district commercial manager for the Council Bluffs district. He will still act as ditrict manager of the Independent Telephone Co. of that city and will maintain his headquarters in Council Bluffs.

W. D. EMERSON, superintendent of the Montrose, Colo., district of the Mountain States Telephone & Telegraph Co., has been placed in charge of both the Grand Junction and Montrose districts, which have been consolidated, with headquarters at Grand Junction. G. W. Pugh, who has been at the head of the Grand Junction district, will take charge of the Montrose exchange.

O. O. WELSHEIMER, for the past three years manager of the Stark County Telephone Company's properties at Canton and Alliance, Ohio, has been appointed manager of the Toledo Home Telephone Co., of Toledo, Ohio, to succeed E. L. Cline, resigned. Mr. Cline expects to devote all his time, from now on, to the management of the telephone properties at Indianapolis, Ind.

Obituary.

WM. W. FISHER, formerly president of the United Telephone Co., of Bellefontaine, Ohio, died recently at his home in Bellefontaine. Mr. Fisher was born on a farm near Greenfield, Ohio, 1843. He was educated in the district schools and later attended the Ohio Wesleyan University at Delaware. As a boy he learned to conduct the affairs on the farm and for some time was engaged in raising sheep. In 1885, being in poor health, Mr. Fisher left the farm and moved to Bellefontaine where he started a meat and grocery business and later organized the Bellefontaine Bridge & Iron Co.

For years he has acted as a director of the United Telephone Co., and has served as president, general manager and treasurer, retiring from the presidency only a few weeks before his death. Mr. Fisher was an industrial leader in Bellefontaine and in Logan county, where he spent practically his entire life. His removal from among the leaders of the local business world will be keenly felt by those with whom he has been associated.

New Companies and Incorporations.

BETHANY, ILL.—The Bethany Mutual Telephone Co. has been incorporated with $8,000 capital stock by Isaac Woodruff, A. C. Cochrane and K. C. Campbell.

SHAMBAUGH, IOWA—The Shambaugh Central Telephone Co. has been incorporated with $10,000 capital stock. Officers and directors have been elected as follows: M. G. Palmer, president; S. R. Turner, vice-president; George W. Reed, secretary-treasurer, and R. A. Duncan, Henry McKeown, Arthur Pfander, Frank McCurdy, Thomas C. A. Pace, Ezra Hardee, Ed. Boe, Alex Pinkerton, T. R. Young and Martin Eberly, directors. The company proposes to put in new poles and wires in its system in Shambaugh.

CHAVIES, KY.—A telephone company is being organized to operate in this city by L. T. Bolling and others. It will be known as the Chavies-Buckhorn Telephone Co. and will have a capital stock of $1,500. Local lines will be built to Buckhorn.

MT. VERNON, KY.—The Mt. Vernon Telephone Co. has recently been incorporated with $1,500 capital stock by James Marett, Wade H. Graves and J. D. Dees. A local system will be built in Mt. Vernon and local and long distance lines to Crab Orchard.

WHICK, KY.—The Whick Telephone Co. is being organized by George Whick and others. The capital stock will be $1,000.

CHARLOTTE, N. C.—Articles of incorporation have been filed by the Paw Creek Telephone Co. with $2,000 capital stock. The incorporators are: Plummer Stewart, F. W. Wilkinson, T. W. Sadler and G. L. Neal.

ADDISON, N. Y.—Articles of incorporation have been filed by the Tuscarora & Cowanesque Valley Telephone Co. with $1,500 capital stock by James Mullaney and Israel Boyer, of Addison; Austin Benedict, Jas. Coon, Ray Swan and Walter Swan, of Tuscarora, N. Y., and S. G. Aldrich, of Nelson, Pa.

COLVER, PA.—Articles of incorporation have been filed by the Colver Telephone Co. with $5,000 capital stock. The directors are as follows: J. Edgar Long, of Colver, J. E. Wilkinson, of Philadelphia, and Thomas B. Hall, of Camden, N. J. Mr. Wilkinson is also treasurer of the company.

GLASGOW, PA.—The Reade Telephone Co. has been incorporated with $5,000 capital stock by Chas. S. Kniss and T. B. Gwin, of Mountaindale; J. T. Glasgow and J. C. Hommer, of Glasgow, Pa. Mr. Hommer is also treasurer.

RIMERSBURG, PA.—The Rimersburg Telephone Co. has been incorporated with $6,000 capital stock. The directors are: Frank McCall, George Bonnett and J. P. Wilson. J. O. Stewart, of Bela, Pa., is secretary.

Construction.

BENHAM, KY.—The Wisconsin Steel Co. will build a telephone system in this city, also lines from Benham to Poor Fork and Jonesburgh.

COLSON, KY.—The Citizens Telephone Co. will construct lines between Whitesburg and Hindman, Ky., giving connections with Hazard. Johnson brothers are managers. The capital stock of the company has been increased to $2,500.

JENKINS, KY.—The Consolidation Coal Co. will extend its local telephone lines from Dunham and McRoberts to Fleming, a new city being built by the Mineral Fuel Co.

WHITESBURG, KY.—The Eastern Kentucky Home Telephone Co. will extend its line to Jenkins, via the headwaters of the Kentucky river, and from Whitesburg to Hazard, a distance of 42 miles. A. Q. Ramey is manager of the company.

BRAINERD, MINN.—The Minnesota Telephone Co., of Onamia, will construct and operate a telephone exchange in this city, connecting with the lines of the Tri-State company of St. Paul.

SALLISAW, OKLA.—The citizens of this city have petitioned the Oklahoma Corporation Commission to require the Pioneer Telephone & Telegraph Co., to erect a modern building for its local office. It is complained that the building in which the company now maintains its switchboard is inadequate and unsanitary.

COGUITLAM, B. C.—The British Columbia Telephone Co., of Vancouver, has completed plans for the erection of a new telephone exchange in this city.

Elections.

BERRYVILLE, ARK.—The Berryville Telephone Co., recently reported incorporated with a capital stock of $10,000, has elected the following officers: President, J. R. Neff, and secretary, R. E. Norris.

THREE RIVERS, MICH.—At an adjourned annual meeting of the Three Rivers Telephone Co. the following directors were elected: O. T. Avery, R. R. Pealer, M. W. Lott, Dr. A. W. Scidmore, Geo. T. Wolf, A. W. Gardner, J. M. Pauli, B. R. Wheeler, R. B. Linsley, John Card and George E. Miller.

LEBANON, TENN.—At a meeting of the stockholders of the Lebanon Home Telephone Co. the following directors were elected for the ensuing year: Vall Castleman, Selden R. Williams, J. J. Askew, H. H. Thomas, W. G. Baird and Neal Deakens. J. J. Askew was elected president.

Financial.

COVINA, CAL.—The Home Telephone Co. has filed application with the railroad commission for permission to issue $40,000 6 per cent. bonds of an authorized issue of $200,000 and to dispose of them at 95.

WILLIAMSBURG, KY.—The Williamsburg Telephone Co. has increased its capital stock from $4,000 to $5,500 and will make a number of improvements to its system. Lines will be built from Williamsburg to Burnside and Jellico and a new exchange will be installed in Williamsburg.

PIERCE, NEB.—The North German Rural Telephone Co. has been granted permission by the state railway commission to issue $425 worth of stock for the purpose of building a rural line.

Franchise.

WATERTOWN, ILL.—The Tri-City Automatic Home Telephone Co., of Davenport, Iowa, has filed application with the village board for a 25-year franchise in this village.